

Always report or correct any conditions that may result in injury to personnel if operation is to be continued.

Before starting the engine or operating any of the crusher components, see that no loose bars, tools, or parts are lying in or on any part of the equipment, as they could cause serious damage to the equipment or bodily injury to personnel.

Before attempting to operate the equipment, make certain the roll crusher and the sources of power are properly grounded. Death by electrocution could result from improperly grounded equipment.

Never fill the fuel tank while the engine is running. Be sure there are no open flames which may ignite the fuel vapor while filling the tank. Always provide a metal-to-metal contact between the fuel container and the fuel tank to avoid igniting the fuel vapors with a static spark.

Keep catwalks and decks free of grease, oil, and mud to prevent slipping and falling.

When operating the crusher in an enclosed area, exhaust gases must be piped to the outside. The exhaust gases contain carbon monoxide which can be fatal if inhaled.

When servicing batteries, do not smoke or use open flame in the vicinity. Batteries generate hydrogen, a highly explosive gas.

Do not operate the crusher with belt guards removed.

Make certain that all personnel are clear of the crusher before engaging the clutch or starting any of the components. Serious injury or death could result.

DURING OPERATION

Always report or correct any conditions that may result in injury to personnel if operation is to be continued.

Do not continue operation of the equipment unless the roll crusher and the source of power are properly grounded. Death by electrocution could result from improperly grounded equipment.

Keep catwalks and decks free of grease, oil, ice and mud to prevent slipping and falling. Use handrails to avoid falling from the crusher or into machinery.

Keep clear of moving machinery at all times to prevent bodily injury.

Stop operation when cleaning, adjusting, or lubricating the components of the roll crusher.

Use extreme caution in removing the radiator cap from an over-heated engine.

Never fill the fuel tank while the engine is running. Be sure there are no open flames which may ignite the fuel vapor while filling the tank. Always provide a metal-to-metal contact between the fuel container and the fuel tank to avoid igniting the fuel vapors with a static spark.

Ether is highly explosive and toxic. Handle ether capsules with extreme caution to prevent rupture until installed in the capsule chamber to avoid fire, explosion, and personal injury.

AFTER OPERATION

Always report or correct any condition that may result in injury to personnel if operation is to be continued.

Stop operation when cleaning, adjusting, or lubricating the components of the roll crusher.

RANGE }
D. 3 }

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 12 September 1964

Operator's Manual

CRUSHER, ROLL: DIESEL AND ELECTRIC DRIVEN;

WHEEL MOUNTED, PNEUMATIC TIRES; 75 TON PER HOUR

(EAGLE CRUSHER MODEL 5230B) FSN 3820-788-5999

(EAGLE CRUSHER MODEL 5230D) FSN 3820-876-7876

COMPONENT OF CRUSHING AND SCREENING PLANT,

DIESEL AND ELECTRIC DRIVEN; WHEEL MOUNTED

75 TON PER HOUR

TM 5-3820-205-10/1, 24 January 1964, is changed as follows:

The title is changed as shown above.

Page 2. In paragraph 1a, line 3, after "5230B," add "Model 5230D."

Paragraph 1d is superseded as follows:

d. The reporting of errors, omissions, and commendations for improving this publication by the individual user is encouraged. Re-

MPP, 4300 Goodfellow Boulevard, St. Louis, MO 63120.

Paragraph 2 is superseded as follows:

2. Forms and Records

DA forms and procedures used for equipment maintenance will be only those prescribed in TM 38-750, Army Equipment Record Procedures.

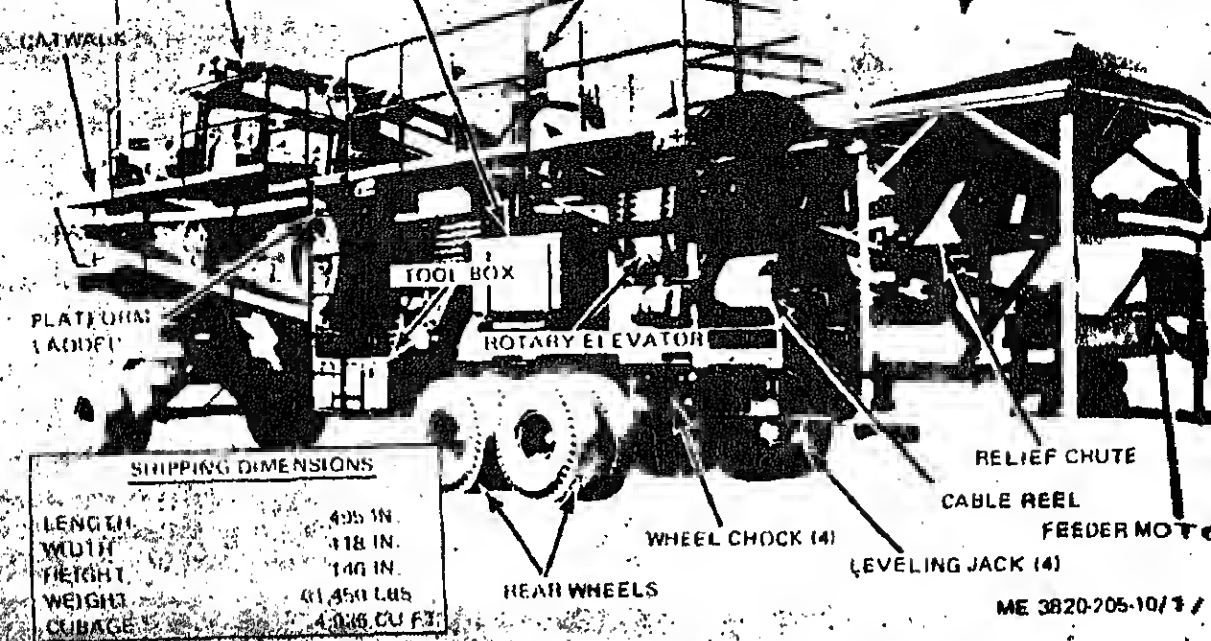


Figure 1.1. Roll crusher—left rear, three-quarter view (Model 5230D).

Page 5. In paragraph 4b (1), line 2, after "5230B," add "and 5230D."

Page 6. In paragraph 4b (2), line 2, after "85," add "(Model 5230B) and 6009-P (Model 5230D)."

In paragraph 4b (5), line 2, after "4517," add "(Model 5230B) and 4517A (Model 5230D)."

In paragraph 4b (6), line 2, after "4601," add "(Model 5230B) and 4601B Model 5230D)."

In paragraph 4b (7), line 2, after "5031," add "(Model 5230B) and 5031A (Model 5230D)."

In paragraph 4b (8), line 2, after "3028," add "(Model 5230B) and 4715 (Model 5230D)."

In paragraph 4b (10), line 2, after "5930," add "(Model 5230B) and 5930-B (Model 5230D)."

Page 7. Paragraph 4b (21) is superseded by the following:

(21) Dimensions and weights.

Model	5230B	5230D
Overall length	495 in.	485 in.
Overall width	120 in.	118 in.
Overall heights	143 in.	148 in.
Weight	59,500 lb.	61,450 lb.
Volume	4,944 cu. ft.	4,935 cu. ft.
Center of gravity	72 in. above ground level, 89 in. forward between center of bogie wheels.	74 in. above ground level, 87 in. forward between center of bogie wheels.

Table 1. Maintenance and operating supplies

(1) Component application	(2) Federal stock number	(3) Description	(4) Quantity required for initial operation	(5) Quantity required for 8 hrs operation	(6) Notes
CRANKCASE		OIL, LUBRICATING: 55-gal. drum as fol- lows:			(1) Includes quantity of to fill engine oil s tern as follows:
	9150-265-9436 (2)	OE 30	24 qt.	(3)	
	9150-265-9429 (2)	OE 10	24 qt.	(3)	Crankcase—18 q
	9150-242-7604 (2)	OES	24 qt.	(3)	Oil filter—6 qts
TANK, FUEL		FUEL OIL, DIESEL: Bulk as follows:			(2) See C9100-IL for ad ditional data and r equisitioning procedu
	9140-286-5283 (2)	DF-A	100 gal (5)	76 gal (6)	
	9140-286-5286 (2)	DF-1	100 gal (5)	76 gal (6)	(3) See LO 5-3820-205-2
	9140-286-5294 (2)	DF-2	100 gal (5)	76 gal (6)	for grade applicat and replenishm intervals.
ENGINE START- ING AIDS,	2910-355-6377	CAPSULE, METAL: Pressure primed (1M0-10).	1 (6)		(4) Use oil as prescrib first item.
RADIATOR		WATER: ANTIFREEZE: 55-gal. drum as follows:			(5) Tank capacity
	6850-243-1990	Ethylene glycol			(6) Average fuel consum tion is 9.5 gals.
	6850-174-1806	Compound arctic			hour of continu operation.
GEAR ASSEMBLY, CONVEYOR DRIVE		OIL, LUBRICATING: (4)	5 qt	(3)	(7) Quantity indicated the minimum quired for one es Start when the te perature is bel 40° F.
RETURN CON- VEYOR GEAR REDUCER.		OIL, LUBRICATING: (4)	4 qt	(3)	
ELEVATING WHEEL GEAR REDUCER.		OIL, LUBRICATING: (4)	2 qt	(3)	
GEAR ASSEMBLY, FEEDER DRIVE.		OIL, LUBRICATING: (4)	2 qt	(3)	
CRUSHER FRAMES		OIL, LUBRICATING, GEAR: 55-gal. drums as follows:			
	9150-577-5848	GO 140	92 qt	(3)	
	9150-577-5845	GO 90	92 qt	(3)	
	9150-257-5443	GOS	92 qt	(3)	
GREASE POINTS		GREASE, AUTOMO-			

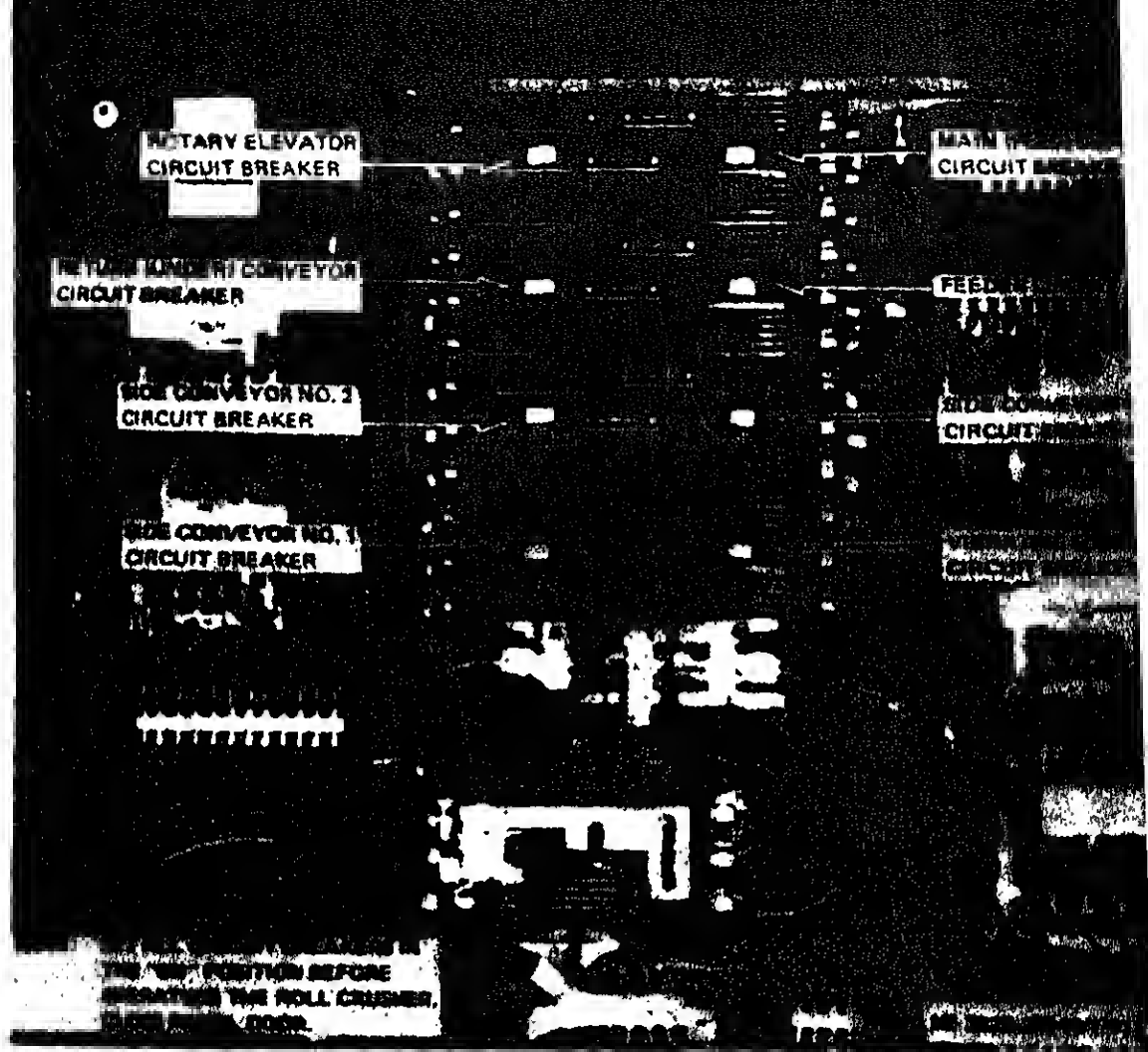


Figure 11.1. Actuating the roll crusher electrical system (model 5230D).

BATTERY-GENERATOR INDICATOR:
REGISTERS CONDITION OF BATTERY.

TACHOMETER-HOUR-METER:
RECORDS ENGINE RPM AND
RUNNING TIME.

HIGH COOLANT
TEMPERATURE
WARNING LIGHT

LOW LUBRICATING
OIL PRESSURE
WARNING LIGHT

TEMPERATURE GAGE:
REGISTERS COOLANT
TEMPERATURE.

OIL PRESSURE GAGE:
REGISTERS ENGINE
OIL PRESSURE.

AIR CLEANER INDICATOR:
INDICATES CONDITION OF
FILTER.

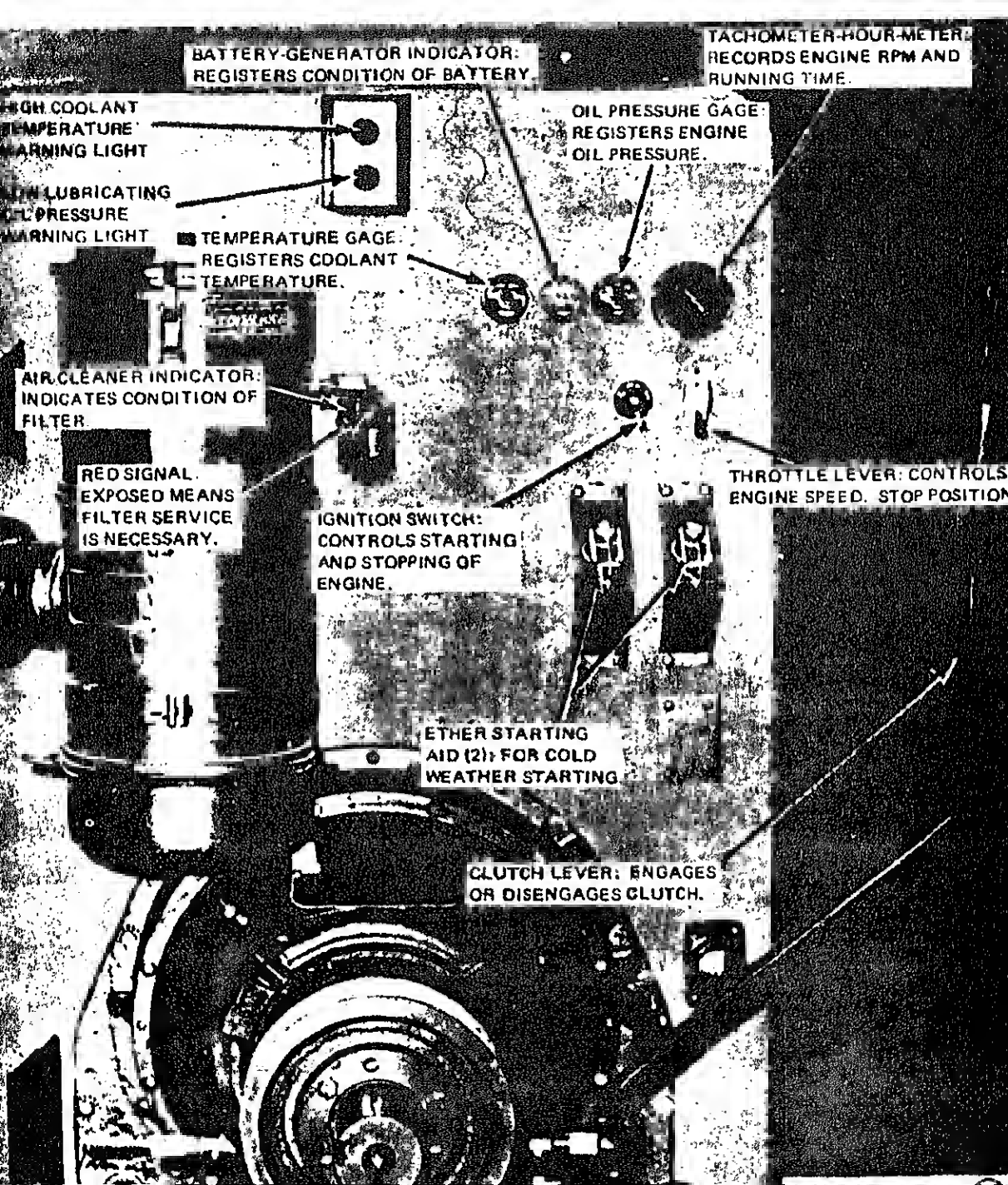
RED SIGNAL
EXPOSED MEANS
FILTER SERVICE
IS NECESSARY.

IGNITION SWITCH:
CONTROLS STARTING
AND STOPPING OF
ENGINE.

THROTTLE LEVER: CONTROLS
ENGINE SPEED. STOP POSITION

ETHER STARTING
AID (2): FOR COLD
WEATHER STARTING

CLUTCH LEVER: ENGAGES
OR DISENGAGES CLUTCH.



ELECTRICAL SYSTEM FROM OVERLOADS. FACT
MUST BE IN THE "ON" POSITION FOR OPERATION

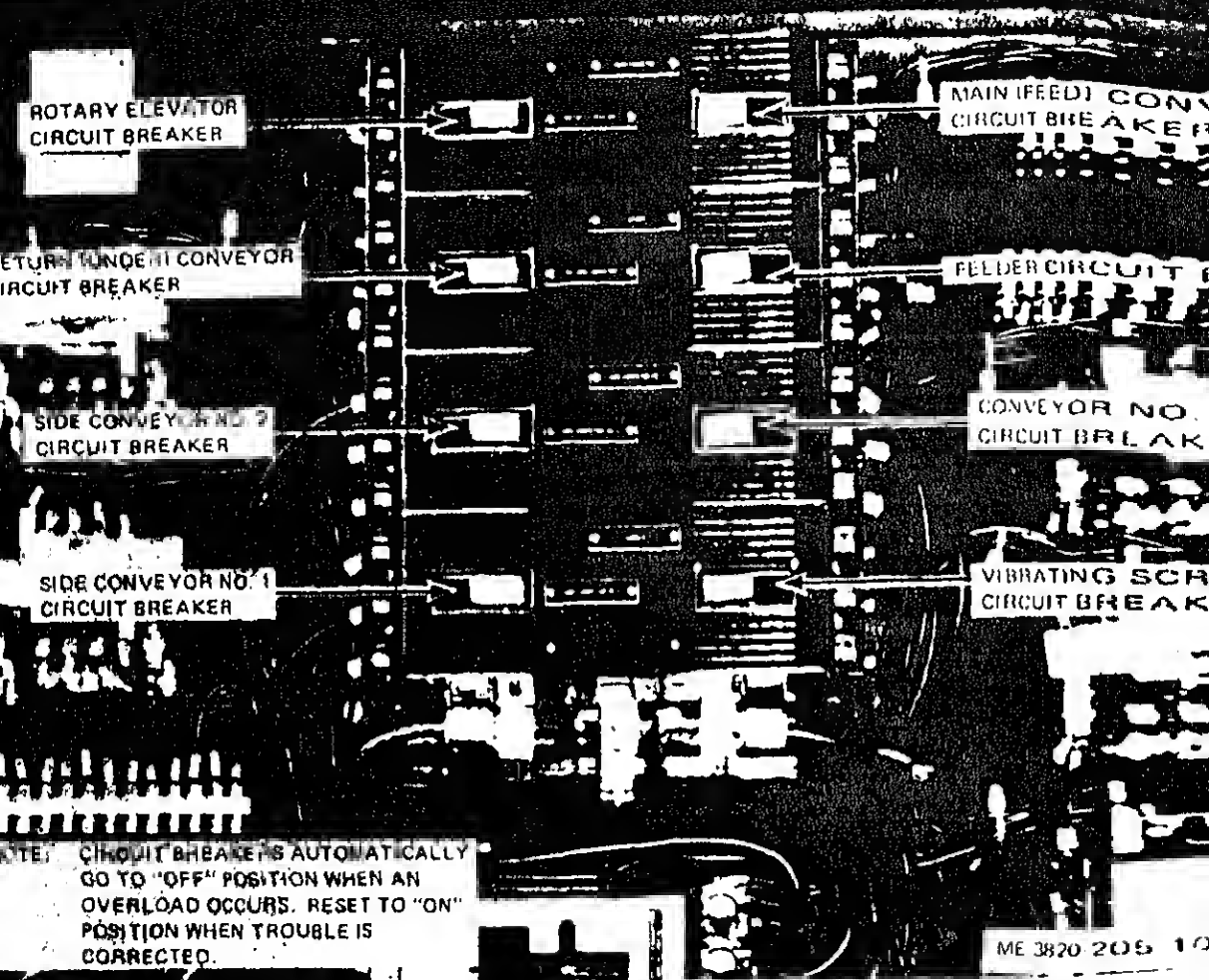
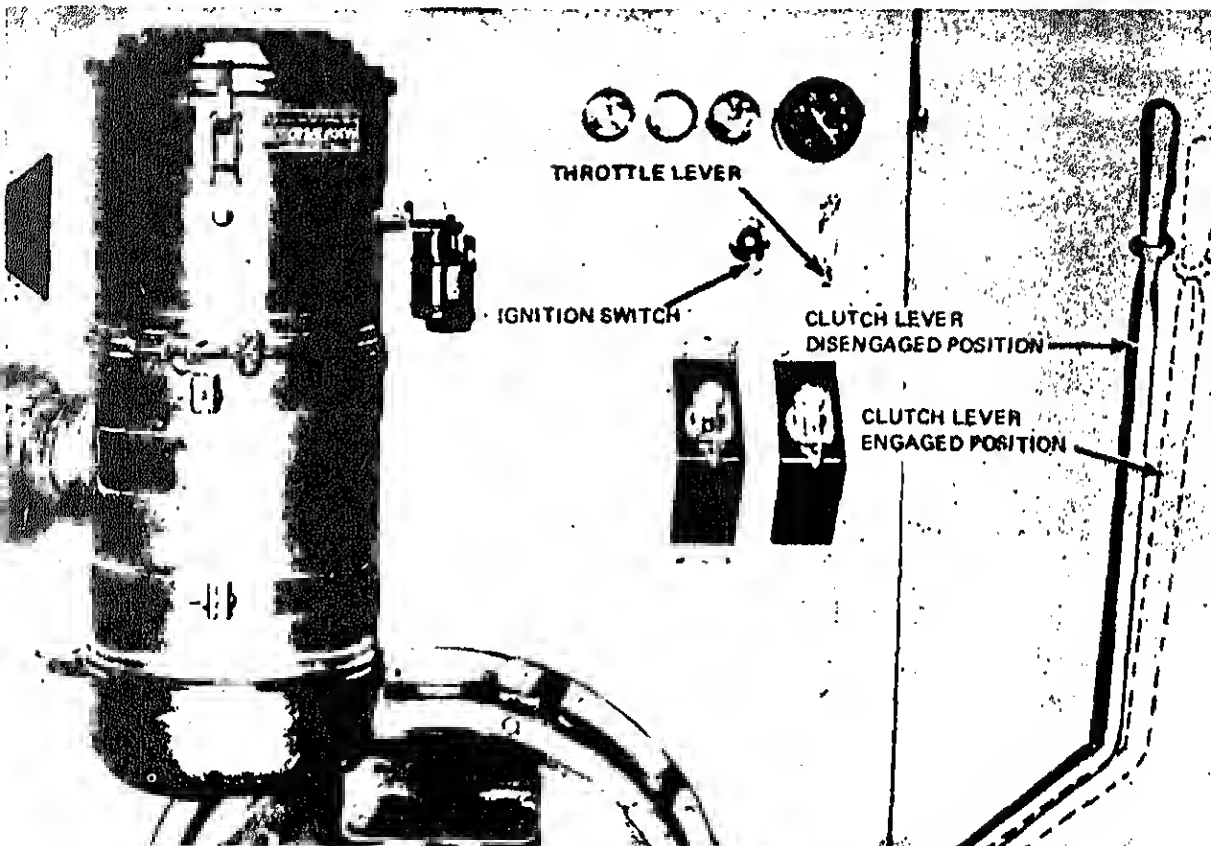


Figure 12.1 (4). Controls and instruments (model 5230D).

CAUTION: DO NOT CRANK THE ENGINE FOR MORE THAN 30 SECONDS AT A TIME. ALLOW ONE MINUTE BETWEEN ATTEMPTS IF ENGINE FAILS TO START.

1. DISENGAGE THE CLUTCH AND MOVE THE THROTTLE LEVER TO 1/4 OPEN.
2. TURN IGNITION SWITCH TO "ON" POSITION, PRESS STARTER BUTTON (RELEASE IMMEDIATELY WHEN ENGINE STARTS). (SEE NOTE.)
3. MOVE THROTTLE LEVER TO "RUN" POSITION.
4. RUN ENGINE AT 1,100 RPM UNTIL OPERATING TEMPERATURE IS REACHED BEFORE APPLYING LOAD.
5. OBSERVE ALL INSTRUMENTS AND GAGES FOR PROPER OPERATING RANGE.



CAUTION: STOP ENGINE IF IGNITION SWITCH FAILS TO RETURN TO "RUN" POSITION AFTER ENGINE STARTS. APPLY LOAD ONLY AFTER COMPLETE ENGINE WARMUP.

NOTE: UNITS OF EQUIPMENT WITHIN SERIAL NUMBER RANGE 6590 THRU 6629 ARE EQUIPPED WITH A DUAL IGNITION-STARTER SWITCH.

NORMAL READINGS

ENGINE TEMPERATURE	165-185° F.
BATT.-GEN. INDICATOR	GREEN RANGE
OIL PRESSURE	55-65 PSI
TACHOMETER HOUR METER	0-240 RPM

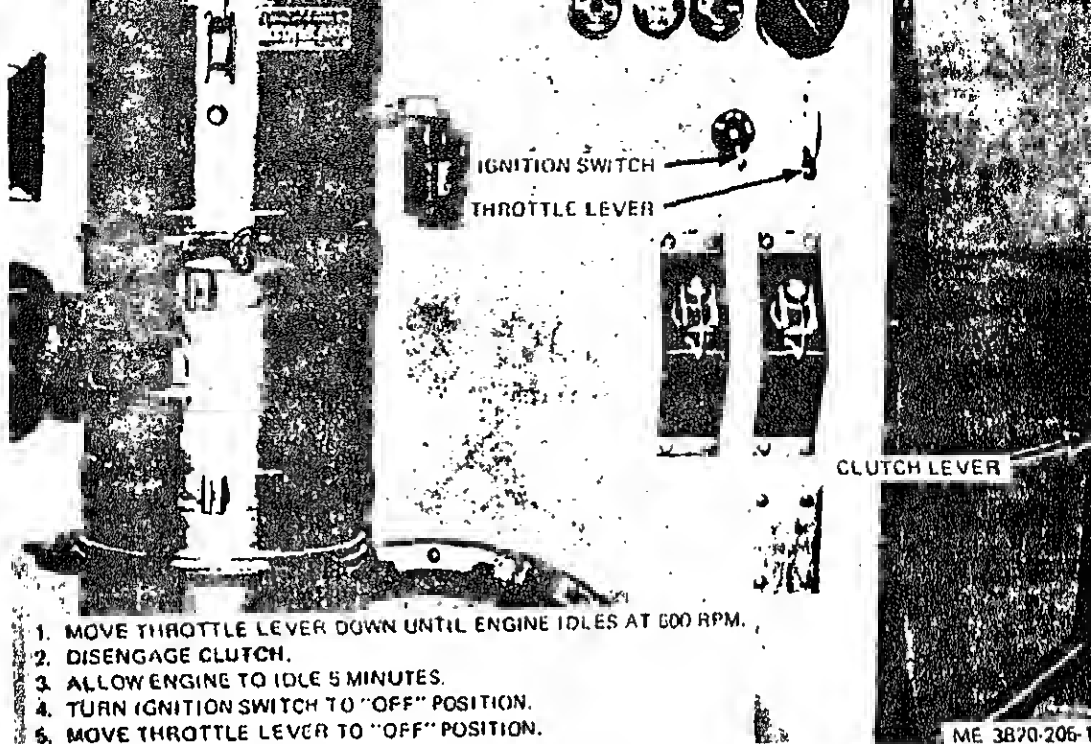


Figure 14.1. Stopping the engine (Model 5230D).

Page 55. Item 9, "is superseded by" "Check to see if red signal is visible." Check the pre-

cleaner and service it when the l approaches the arrow indicator on

JOH

REMOVE BATTERY FILL CAPS AND FILL EACH CELL WITH DISTILLED WATER TO
1/8 INCH ABOVE PLATES

FILL CAP (24)

TERMINAL CONNECTOR (8)

NEGATIVE BATTERY
TERMINAL (4)

ROBBER NUT

HANDLE

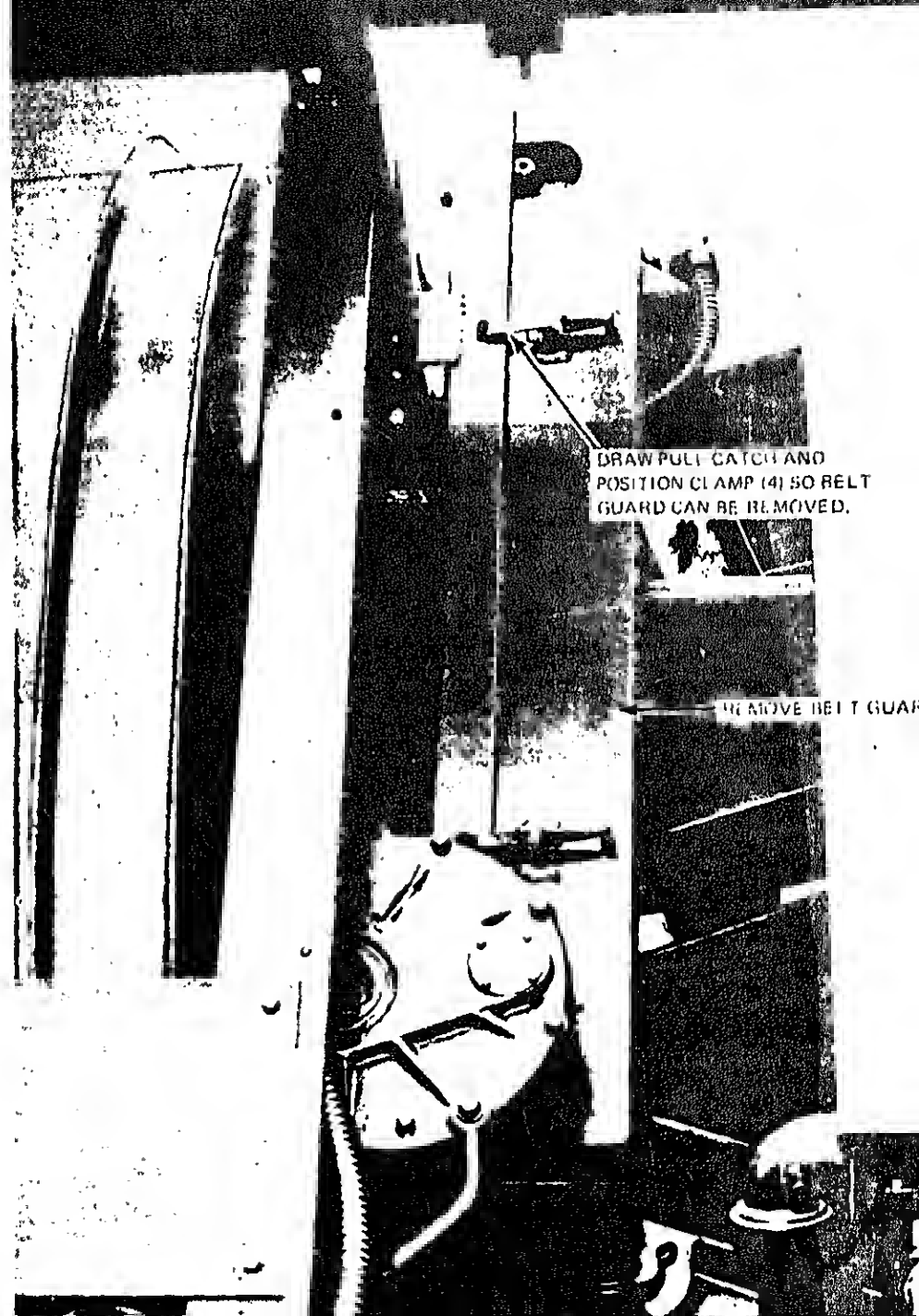
LOCKNUT

POSITIVE BATTERY TERMINAL (4)

ME 3820-205 10/1/77

2

Figure 27.1. Batteries service (Model 5230D).



DRAW PULLEY CATCH AND
POSITION CLAMP (4) SO BELT
GUARD CAN BE REMOVED.

RE MOVE BELT GUARD

TROOP INSTALLED OR AUTHORIZED LIST

Section I. INTRODUCTION

1. Scope

This appendix lists basic issue items and items troop installed or authorized which accompany the crusher and are required by the crew/operator for operation, installation, or operator's maintenance.

2. General

This basic issue items and items troop installed or authorized list is divided into the following sections:

a. *Basic Issue Items List*—Section II. Not applicable.

b. *Items Troop Installed or Authorized List*—Section III. A list in alphabetical sequence of items which, at the discretion of the unit commander, may accompany the end item, but are not subject to be turned in with the end item.

3. Explanation of Columns

The following provides an explanation of columns in the tabular list of items troop installed or authorized, section III.

a. *Source, Maintenance, and Recoverability Code(s) (SMR)*: Not applicable.

b. *Federal Stock Number*. This column indicates the Federal stock number assigned to the item which will be used for requisitioning purposes.

c. *Description*. This column indicates the Federal item name and any additional description of the item required.

d. *Unit of Measure (U/M)*. A 2-character alphabetic abbreviation indicating amount or quantity of the item upon which the allowances are based; e.g., fit, ea, pr; etc.

e. *Quantity Authorized*. This column indicates the quantity of the item authorized to be used with the equipment.

Section III. ITEMS TROOP INSTALLED OR AUTHORIZED LIST

(1) SMR code	(2) Federal stock number	(3) Description	(4) Unit of meas	(5) Qty au
	4210-555-8837	EXTINGUISHER, FIRE	ea	1

To be distributed in accordance with DA Form 12-25B, (qty rqr block No. 44)
Maintenance Requirements for Rock Drilling Equipment.

OPERATOR'S MANUAL

**CRUSHER, ROLL: DIESEL AND ELECTRIC DRIVEN; WHEEL MOUNTED, PNEUMATIC TIRES; 75 TON PER HOUR (EAGLE CRUSHER MODEL 5230B) FSN 3820-788-599
COMPONENT OF CRUSHING AND SCREENING PLANT; DIESEL AND ELECTRIC DRIVEN; WHEEL MOUNTED; 75 TON PER HOUR**

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CHAPTER I

INTRODUCTION

Section I. GENERAL

1. Scope

a. These instructions are published for the use of the personnel to whom the Roll Crusher, Eagle Crusher Model 5230B is issued. They provide information on the operation, lubrication, and preventive maintenance services of the equipment, accessories, components, and attachments.

b. Appendix I contains a list of publications applicable to this manual. Appendix II contains the basic issue items authorized for use by the operator. The maintenance allocation chart is located in TM 5-3820-205-20/1-1.

c. Numbers in parentheses on illustrations indicate quantity. Numbers preceding nomenclature callouts on illustrations indicate the preferred maintenance sequence.

d. The direct reporting by the individual user, of errors, omissions, and recommenda-

tions for improving this manual is encouraged. DA Form 2028 (Recommended Changes to DA Technical Manual Part 1 or Supply Manual 7, 8, or 9) will be used for reporting these improvements. This form must be completed in triplicate using pencil or typewriter. The original and one copy must be forwarded direct to the Commanding General, U. S. Army Mobility Support Center, 1000 SMOMS-MM, P. O. Box 119, Columbus, GA 31916. One information copy will be provided to the individual's immediate supervisor, officer, noncommissioned officer, superintendent, etc.).

2. Record and Report Forms

For record and report forms applicable to the operator, refer to TM 38-750.

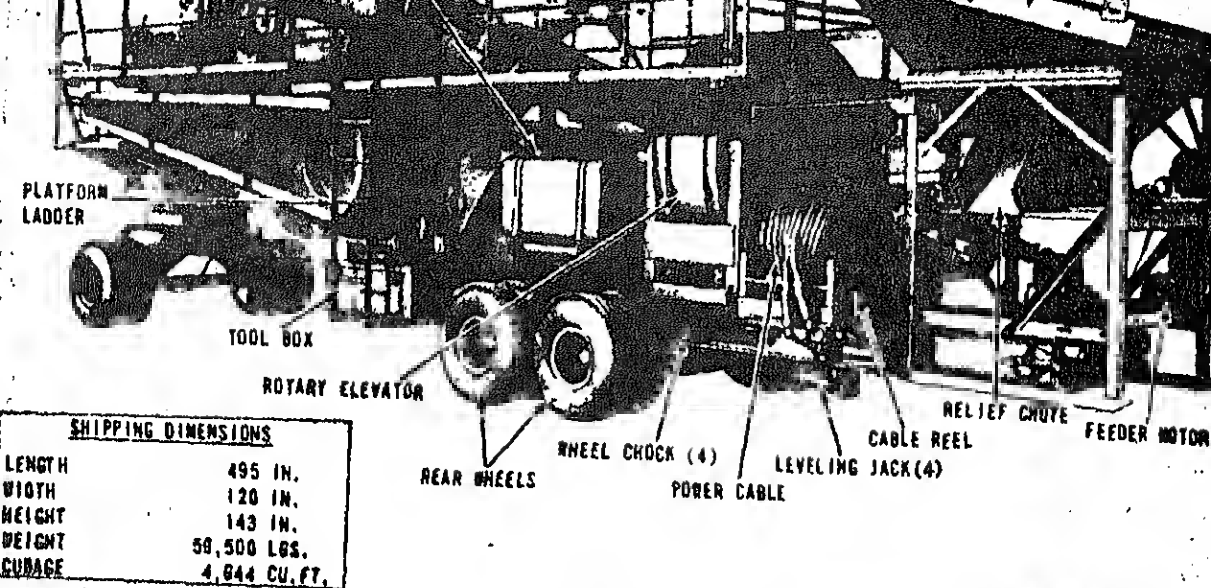
Note. Applicable forms, excluding standard forms which are carried by the operator, will be kept in a bag mounted on the equipment.

Section II. DESCRIPTION AND DATA

3. Description

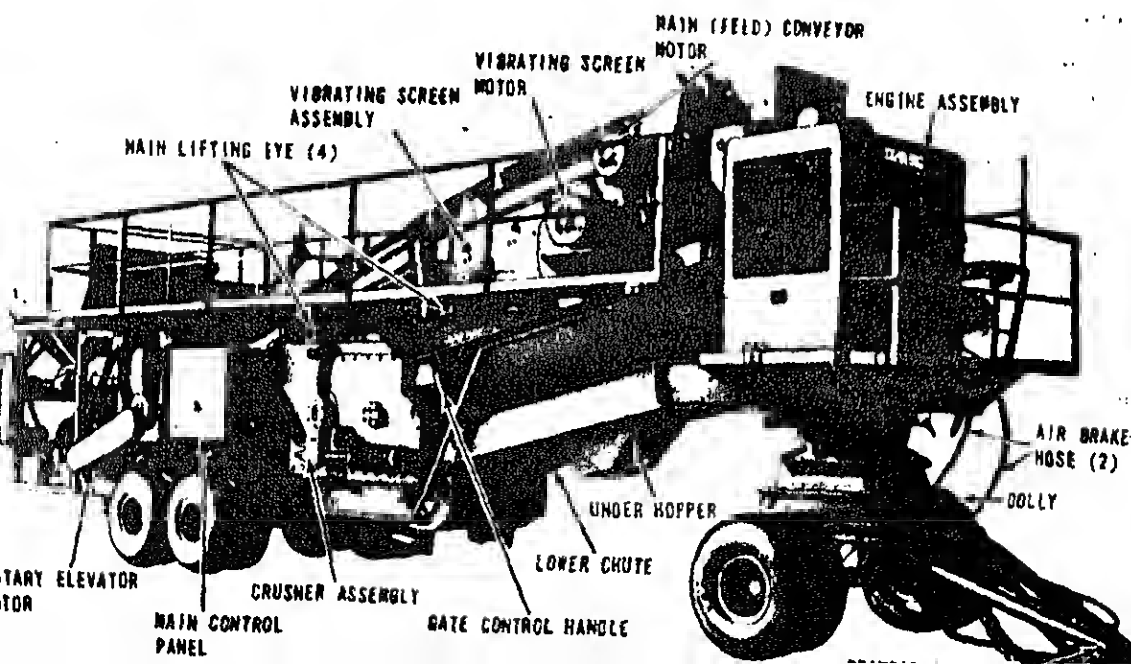
a. *Roll Crusher.* The Roll Crusher, Eagle Crusher Model 5230B (figs. 1 and 2) is a portable, self-contained unit used to crush and grade aggregate. A four cycle, six cylinder diesel engine operates the crusher roll assembly. Electric motors, driven by an extraneous power source, operate the vibrator screen assembly, return (under) conveyor, main (feed) conveyor, rotary elevator, and reciprocating feeder assembly. These components of the roll crusher, mounted on a trailer and dolly, are described in appropriate sections of this manual.

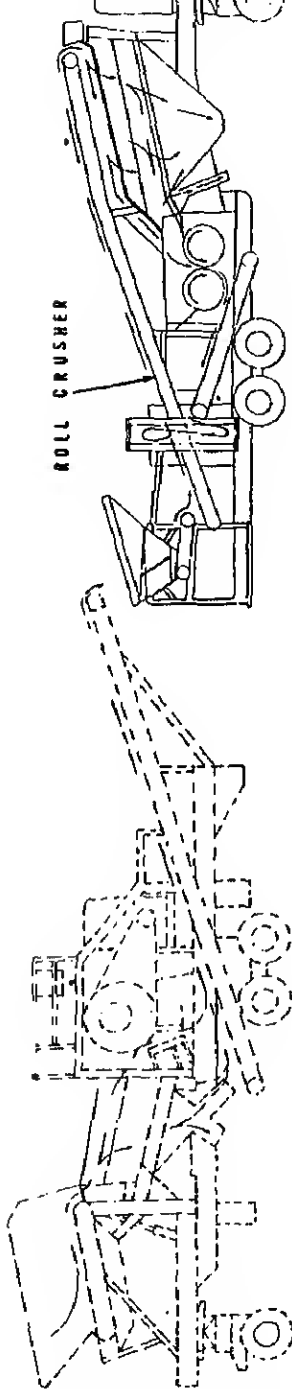
must be set up on firm level ground and as close to the source of material to be processed as possible, and in position so the conveyor can dispel the processed aggregate at the desired location for stock piling or hauling. Figure 1 illustrates a typical crushing and screening plant layout where the crusher may be used as a component. The positions of the various components as shown are not necessarily the same; only the relationship to each other is indicated. For example, only the feed charge conveyor is absolutely necessary for operation, the remaining three indicate



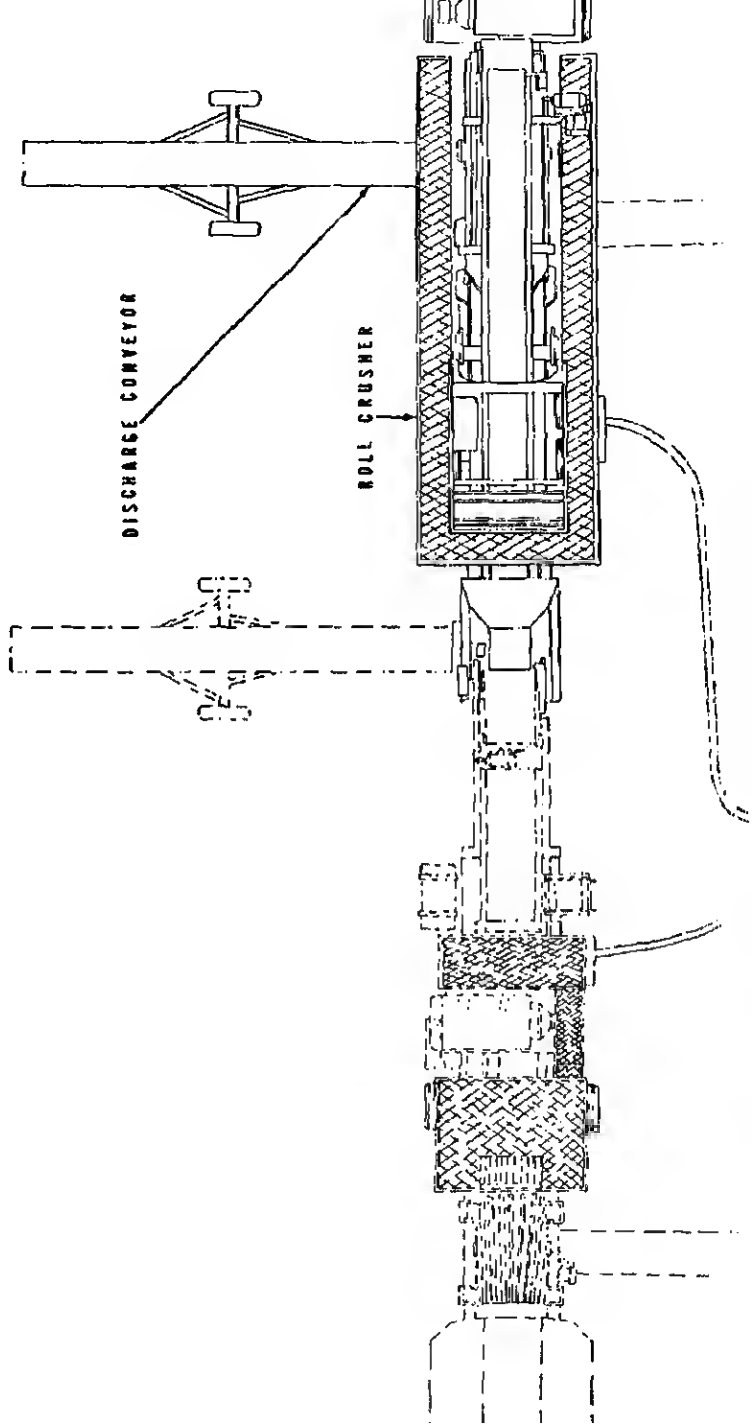
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Figure 1. Roll crusher, left rear, three-quarter view.





ROLL CRUSHER



DISCHARGE CONVEYOR

ROLL CRUSHER

4. Identification and Tabulated Data

a. *Identification.* The roll crusher has 15 major identification and instruction plates which are applicable to the operator.

- (1) *Corps of Engineers identification plate.* Located on the left of the main frame of the trailer, below the vibrating screen assembly. It gives the Federal stock number, model number, and dimensions.
- (2) *Engine manufacturer's identification and data plate.* Located on the left side of the engine block, behind the fuel injection pump. It gives the manufacturer, model, and tappet clearance.
- (3) *Clutch identification and instruction plate.* Located on the clutch housing inspection hole. It gives the adjustment and lubrication data.
- (4) *Transportation data plate.* Located on the left of, the main frame of the trailer, below the vibrating screen assembly. It gives overall length, width, height, and center of gravity.
- (5) *Feeder, return (under) conveyor, and rotary elevator motor identification plates.* Provides manufacturer, model, horsepower, amps (amperes), volts, and rpm (revolutions per minute). The plates are identical and are located on the motor housing.
- (6) *Secondary trailer identification plate.* Provides the manufacturer and serial number. It is located on the left of the main frame of the trailer.
- (7) *Dolly identification plate.* Provides the manufacturer, model, and serial number. It is located on the front of the dolly frame below the fifth wheel.
- (8) *Vibrating screen identification plate.*

volts, and cycles. It is located on the vibrating screen motor housing.

- (10) *Main (feed) conveyor motor identification plate.* Provides the manufacturer, model, and serial number, amps, volts, and cycles. It is located on the conveyor motor housing.
- (11) *Main (feed) conveyor gear reducer identification plate.* Provides the manufacturer, class, horsepower, and ratio. It is located on the gear reducer housing.
- (12) *Rotary elevator and return conveyor gear reducer identification plate.* Provides the manufacturer, class, horsepower, and ratio. It is located on the rotary elevator gear reducer housing.
- (13) *Feeder gear reducer identification plate.* Provides the manufacturer, class, horsepower, and ratio. It is located on the feeder gear reducer housing.
- (14) *Main control panel identification data plate.* Provides the manufacturer, volts, phase, cycles, and serial number. It is located inside the main control panel on the upper left-hand side.
- (15) *Main control panel caution plate.* Provides the manufacturer, volts, phase, cycles, and serial number. It is located on the outside of the main control panel door. It states the safe ground rod and lead should be installed at the power source before using the receptacles.

b. Tabulated Data.

(1) General.

Manufacturer.....	Eagle Crusher
Model.....	5230B
Type.....	Roll Crusher
Plant unit function.....	Secondary
Tire pressure.....	100 psi (pounds per inch)

Type.....Diesel
 Cycle.....4
 Number of cylinders.....6
 Rated horsepower.....144 hp (horsepower) at
 1,400 rpm
 Oil pressure.....55-65 psi
 Brake horsepower.....202 hp at 1,400 rpm
 Cooling system:
 Type.....Liquid
 Temperature range.....155° to 185° F. (degrees)
 (Fahrenheit)

Electrical system:
 Operating voltage.....24 v (volts)
 Number of batteries.....4 (series parallel
 connected)
 Type of batteries.....Storage, 12-v, 6-cell (type
 designation 5TN).
 Type of ground.....Negative
 Air cleaner-type.....Dry
 Clutch-type.....Friction, dry, positive-
 action

(3) Roll crusher assembly.

Manufacturer.....Eagle Crusher Co., Inc.
 Model.....24 x 30
 Size of discharge opening..... $\frac{1}{4}$ to 3 in. (inches)
 Speed in rpm—rolls.....87-90
 Ratio of reduction.....3.38 to 1

(4) Vibrating screen assembly.

Manufacturer.....Allis-Chalmers Manufac-
 turing Co.
 Model.....S
 Type.....Rip-flo
 Size.....4 x 10 DD
 Maximum speed.....900 rpm

(5) Reciprocating feeder.

Manufacturer.....Eagle Crusher Co., Inc.
 Model.....4517
 Capacity (24 in.).....175 tph (tons per hour)

(6) Rotary elevator.

Manufacturer.....Eagle Crusher Co., Inc.
 Model.....4601
 Size.....72 in. dia (diameter) x 24
 in. w (wide)

(7) Main (feed) conveyor.

Manufacturer.....Eagle Crusher Co., Inc.
 Model.....5031
 Capacity.....175 tph
 Belt width.....24 in.

(8) Return (under) conveyor.

Manufacturer.....Eagle Crusher Co., Inc.
 Model.....30288

Manufacturer.....General Electric
 Model.....5KG215BG202
 Type.....KG
 Horsepower.....5
 Revolutions per minute.....1,745
 Volt.....208-220/440
 Phase.....3
 Cycle.....60
 Amperes.....14.2/7.1
 Time rating.....Continuous

(12) Vibrating screen motor.

Manufacturer.....General Electric
 Model.....5KG4284B2
 Type.....KG
 Horsepower.....15
 Revolutions per minute.....1,755
 Volt.....208-220/440
 Phase.....3
 Cycle.....60
 Amperes.....40.8/20.4
 Time rating.....Continuous

(13) Main (feed) conveyor motor.

Manufacturer.....General Electric
 Model.....5KG4255B2
 Type.....KG
 Horsepower.....10
 Revolutions per minute.....1,745
 Volt.....208-220/440
 Phase.....3
 Cycle.....60
 Amperes.....27.4/13.7
 Time rating.....Continuous

(14) Main (feed) conveyor gear reducer.

Manufacturer.....General Electric
 Model.....7GT215FDONC
 Class.....1
 Horsepower.....16.9 hp at 1,750 rpm
 Ratio.....15:1
 Code.....XS

(15) Rotary elevator gear reducer.

Manufacturer.....General Electric
 Model.....7GT207FDONC
 Class.....1
 Horsepower.....11.1 hp at 1,750 rpm
 Ratio.....15:1
 Code.....WS

(16) Feeder gear reducer.

Manufacturer.....General Electric
 Model.....7GT207FDONC
 Class.....1
 Horsepower.....11.1 hp at 1,750 rpm

aggregate sizes.	
Crusher rolls aggregate sizes.	3 in. to ¼ in. discharge size
Conveyor belt width	24 in.

(19) Adjustment data.

Defectors (hopper loaded) and belt scrappers.	Barely touch conveyor belt
Conveyor belt	Just enough to prevent slipping when loaded.
Generator belt	¾ in. deflection midway between pulleys.
Electric motor drive belts	½ in. deflection midway between pulleys.
Roll adjusting spring	23 in.

(20) Capacities.

Fuel tank	100 gal (gallons)
Crankcase	18 qt (quarts)
Oil filters	6 qt
Radiator	70 qt
Gear assembly conveyor drive.	5 qt
Return conveyor gear reducer.	4 qt
Gear assembly, feeder drive	2 qt
Elevating wheel gear reducer.	2 qt
Crusher frames (crusher gearcase).	92 qt

(21) Dimensions and weights.

Overall length	495 in.
----------------	---------

Center of gravity	72 in. above ground level
	89 in. forward between center of bogie wheels

5. Difference in Models

This manual covers only the Eagle Model 5230B Roll Crusher, serial number ranges 6550 through 6587 and 6590 through 6629. Where differences exist between the two serial number ranges, each serial number range is covered separately in the applicable maintenance section of this manual. Units within serial number range 6590 through 6629 have two diesel engine air cleaners, units within serial number range 6550 through 6587 have one. Units within serial number range 6590 through 6629 have both coolant temperature and lubricating oil pressure warning lights, but the units within serial number range 6550 through 6587 do not. Units within serial number range 6590 through 6629 are equipped with a dual ignition-start switch, units within serial number range 6550 through 6587 are equipped with a separate switch for the ignition circuit and another switch for the starter energizing circuit.

CHAPTER 2

INSTALLATION AND OPERATION INSTRUCTIONS

Section I. SERVICE UPON RECEIPT OF EQUIPMENT

Unloading the Roll Crusher

The operator may assist in unloading the roll crusher from the common carrier. The operator help remove the tie-down cables, strapping, lashing, and the like which secure the roll crusher on the carrier. Organizational Maintenance personnel will perform the remaining operations.

Inspecting and Servicing the Roll Crusher

Note. Make sure the roll crusher is completely depressured before servicing. Make certain preservatives have been removed from the crankcase and fuel tanks.

Perform the preventive maintenance services listed in paragraph 29.

Make a complete visual inspection to see that the required tools, repair parts, publications, accessories, and attachments are with the crusher and are in serviceable condition.

Visually inspect the roll crusher for loss of parts or damage which may have occurred during loading, shipping, or unloading.

Report all damage and deficiencies to organizational maintenance.

Installation or Setting-Up Instructions

Locate the roll crusher on a flat or leveled surface. If necessary, use any suitable equipment such as a bulldozer to level the site. Plan the site so there will be no obstruction to trucks or other hauling vehicles going to and from the crusher. Refer to figure 3 for suggested placement of plant components. After the crusher is located, level the area immediately under the

c. The crusher is equipped with four leveling screw-type leveling jacks. Lower the leveling jacks (A, fig. 4) and position the jacks in the jack pad recess as instructed on B, figure 4. If the ground is soft or provides a poor bearing surface, place timbers or other suitable supports under the jack pads.

d. Level the trailer frame. Check in several places to avoid having a twist or sag in the frame. Adjust the jacks accordingly. Accuracy in leveling is very important, because an improperly leveled crusher unit may cause drive belts and conveyor belts to run off; material to travel to one side of screens; and run mountings of the vibrating screen to twist.

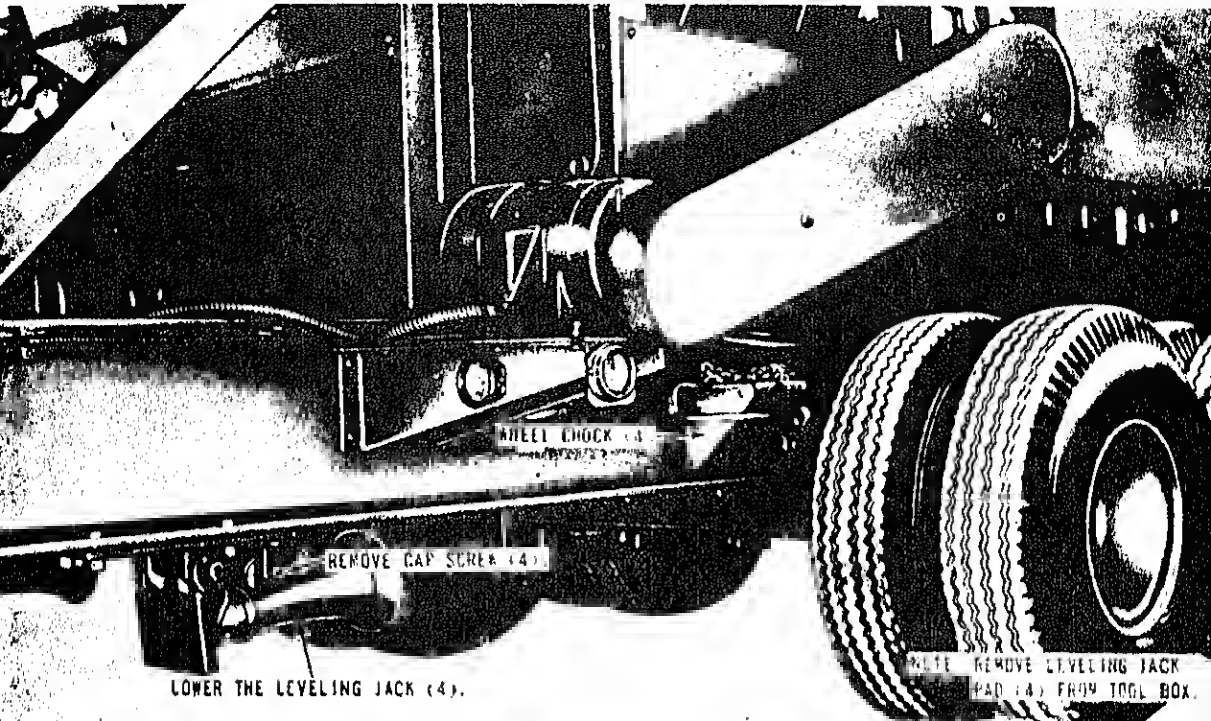
e. Crib the roll crusher by raising the front end with the leveling jacks, keeping the crusher level, and build the cribbing solidly up to the frame. Screw the jacks back in a few turns, allowing the weight to rest on the cribbing. Crib under the rear end of the crusher frame in a similar manner.

Caution: Install the leveling jacks and cribbing so that roll crusher will be level lengthwise and crosswise, and the weight of the crusher is removed from the wheels and axles.

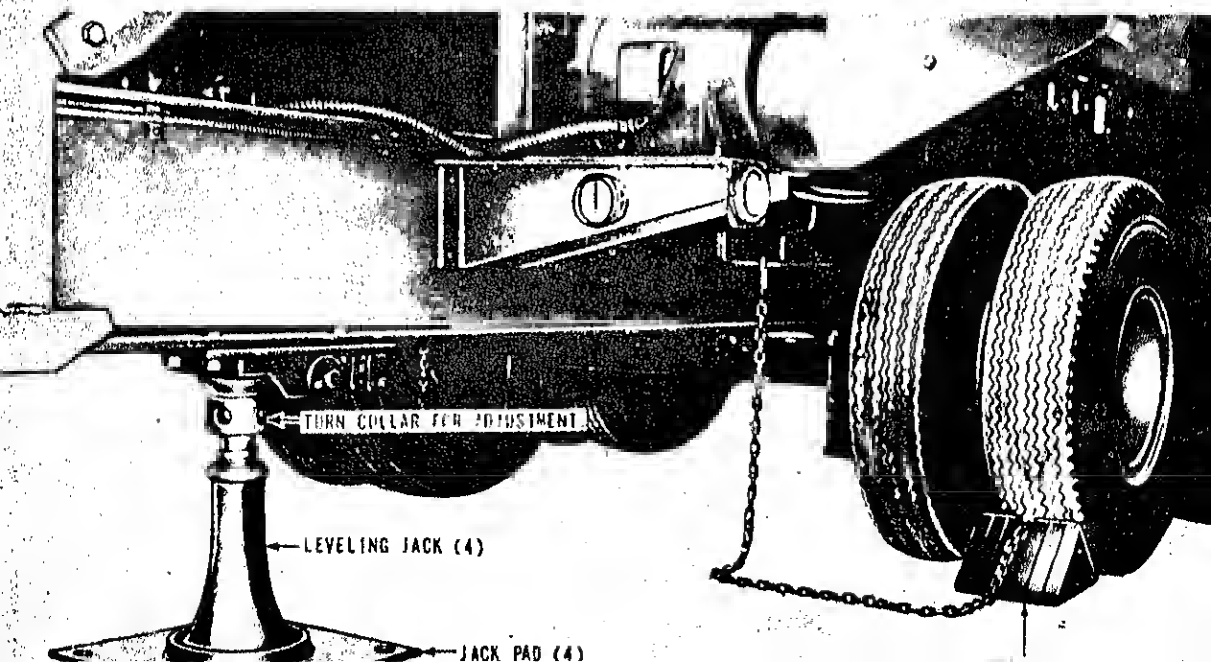
f. Install the drawbar jack as illustrated in figure 4, (on units of equipment within No. range 6590 through 6629.)

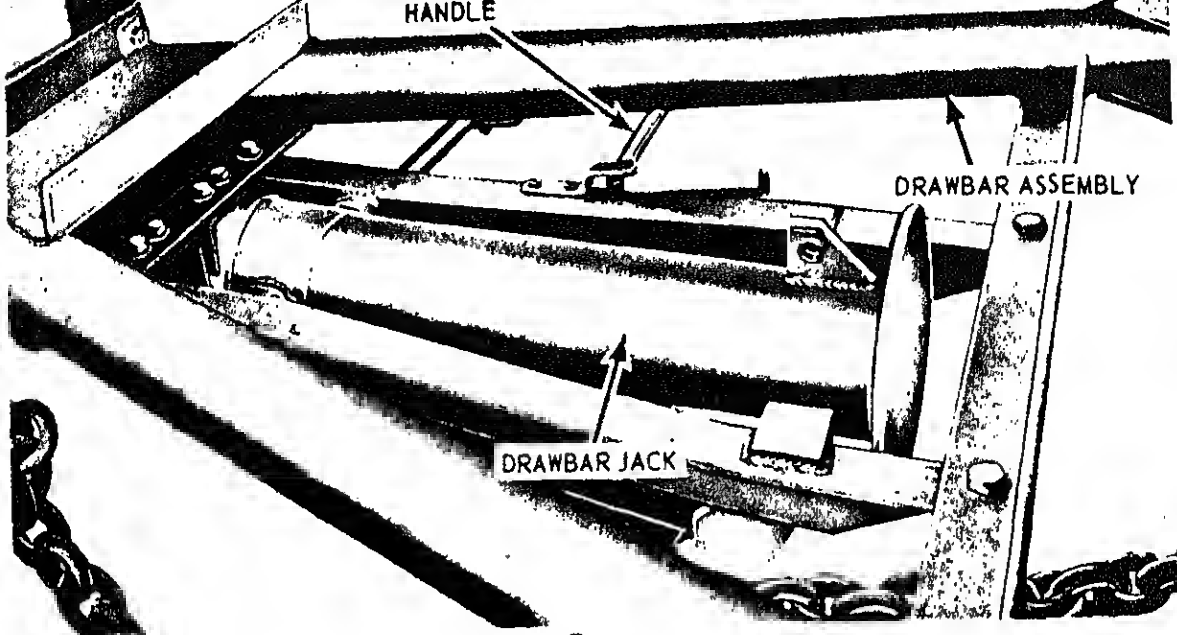
g. Position the discharge conveyor of the crushing and screening plant as illustrated in figure 3.

h. Install the ground rod as instructed

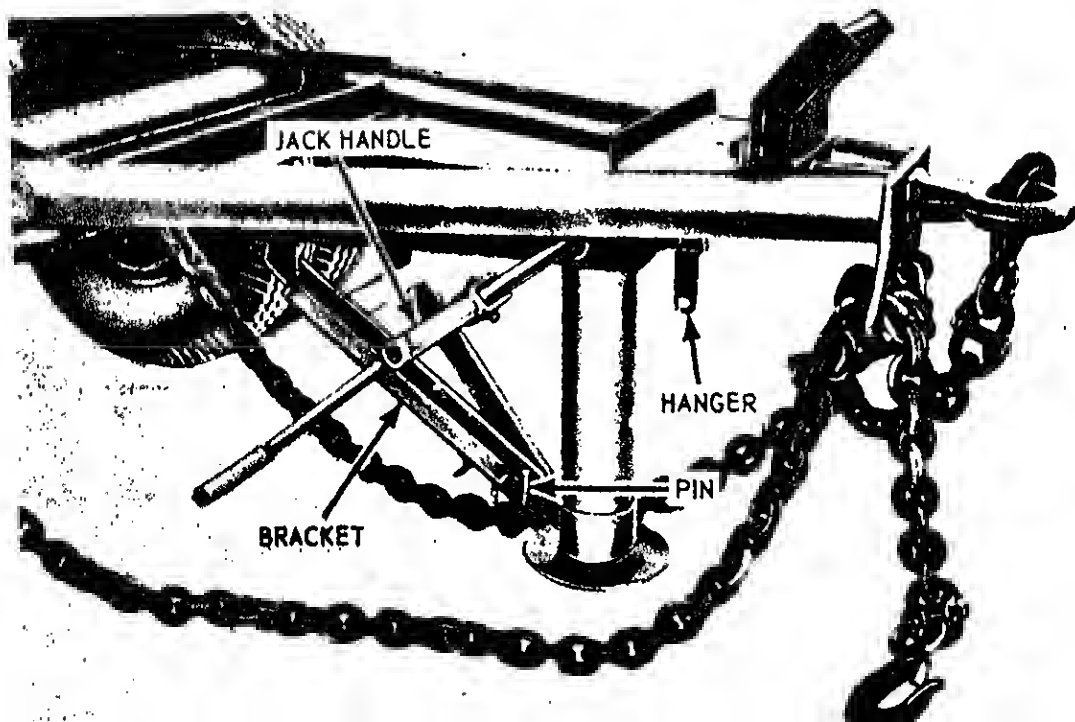


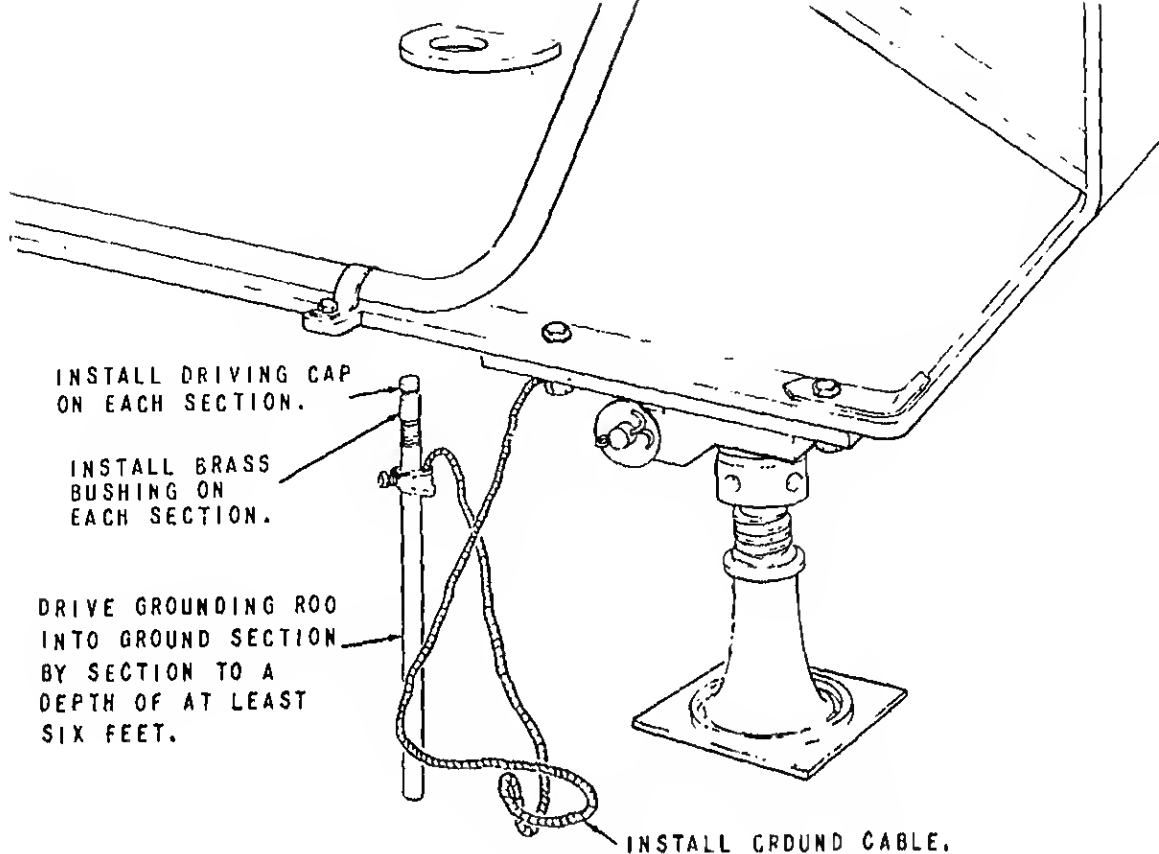
A





C





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Figure 5. Grounding the roll crusher.

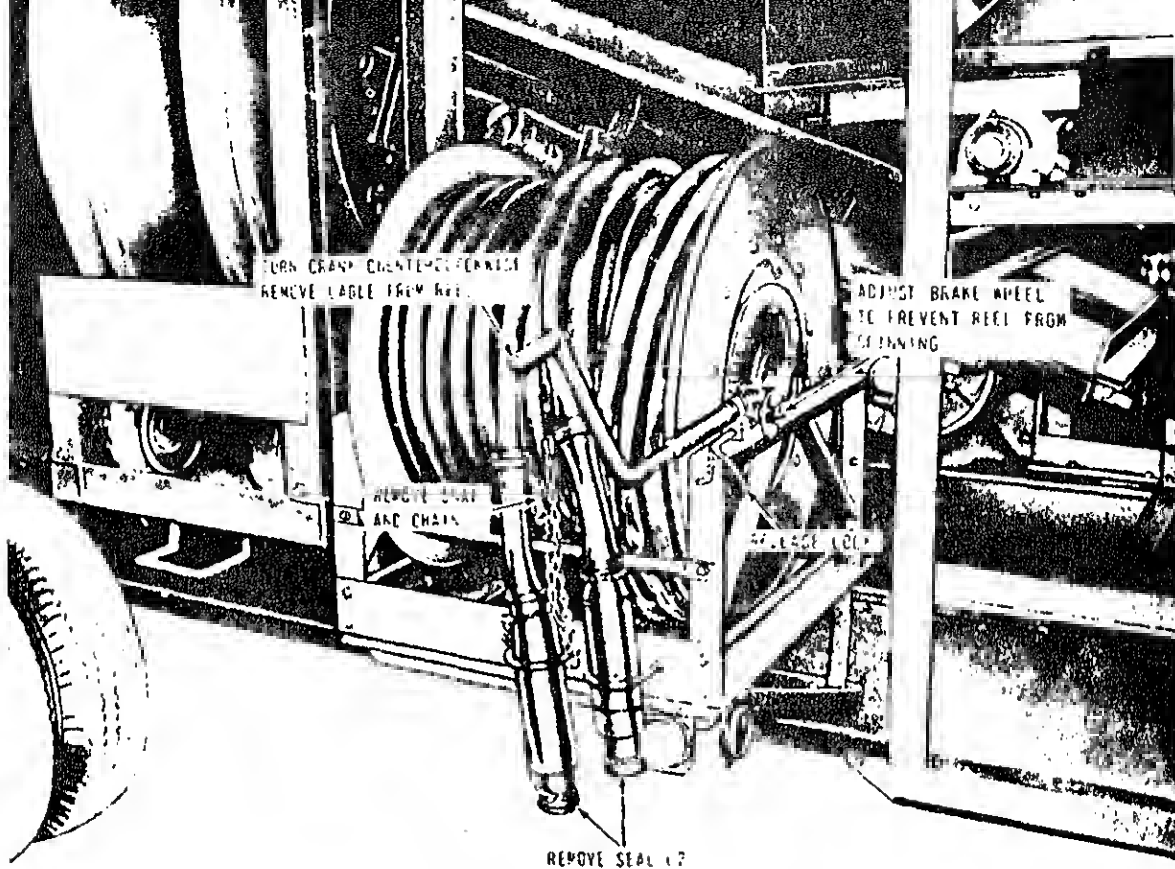
jumper cable to the control panel, and connect the main power cable to the control panel and main power source as instructed on figure 8.

Warning: Make certain the roll crusher and the source of power, are properly grounded be-

fore installing the short main power the power source.

k. Connect the feeder jumper cable to the feeder motor as instructed on figure 9.

l. Install the feeder relief chute exte



ENC 3820-205-10/1 7

Figure 6. Main power cable installed on reel.

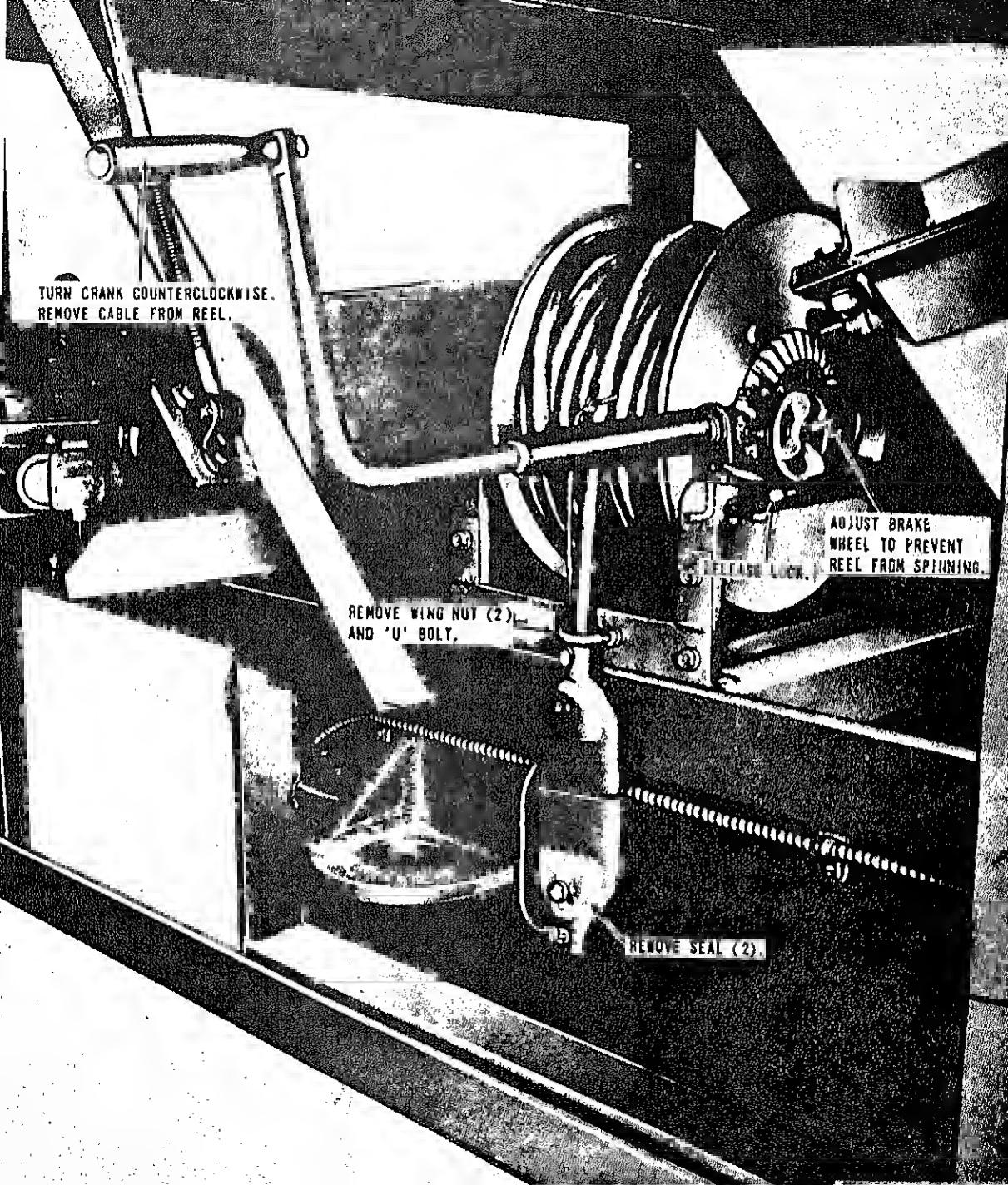
the feeder relief chute as instructed on figure 10.

m. Open the main control panel door and push the circuit breakers to the ON position as instructed on figure 11.

9. Movement to a New Worksite

a. Remove all aggregate material from the conveyor belts, hoppers, and crusher.

b. Disconnect the main power cable and the short main power cable from the power source

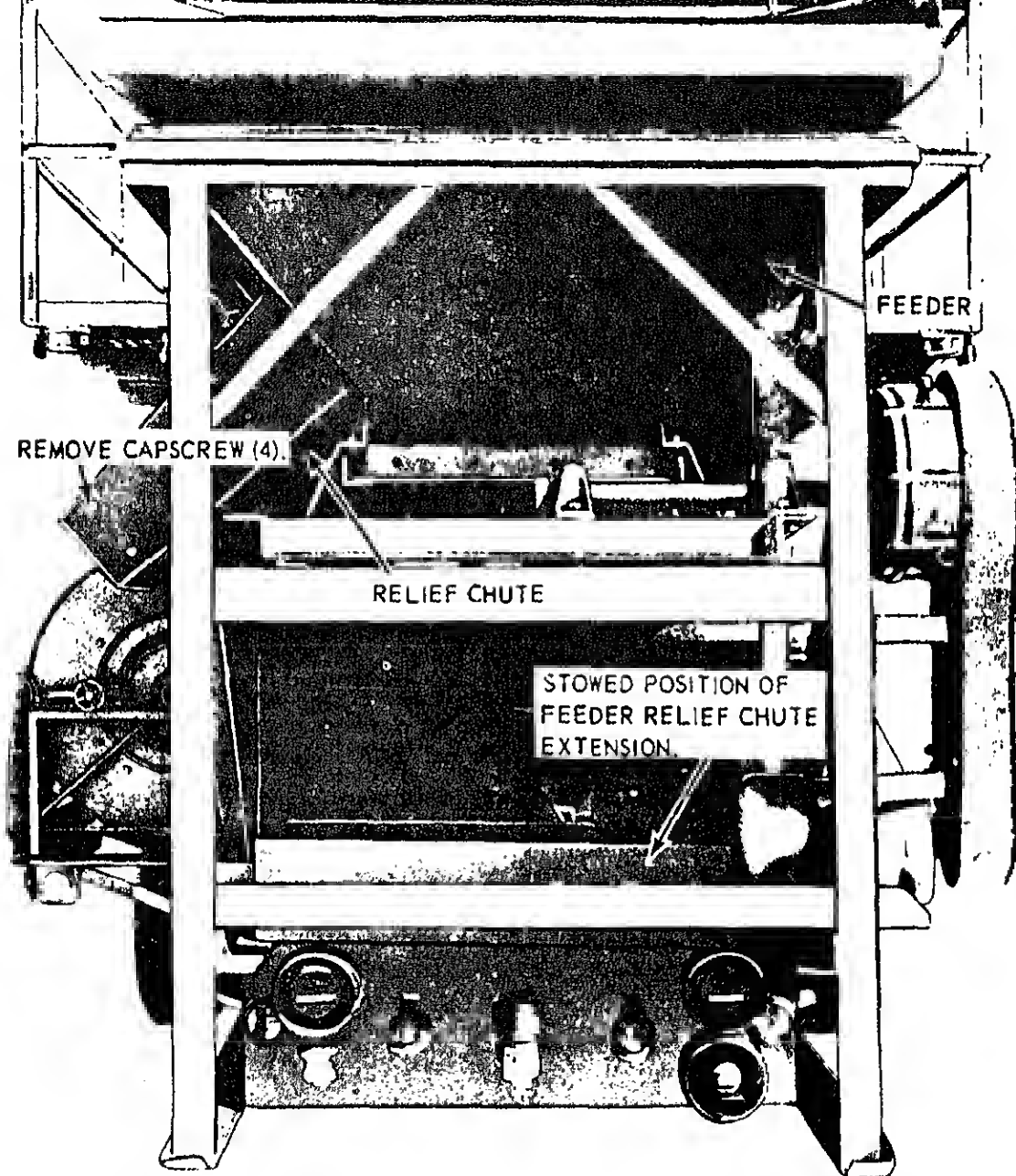


TURN CRANK COUNTERCLOCKWISE.
REMOVE CABLE FROM REEL.

REMOVE WING NUT (2)
AND 'U' BOLT.

ADJUST BRAKE
WHEEL TO PREVENT
REEL FROM SPINNING.

REMOVE SEAL (2).

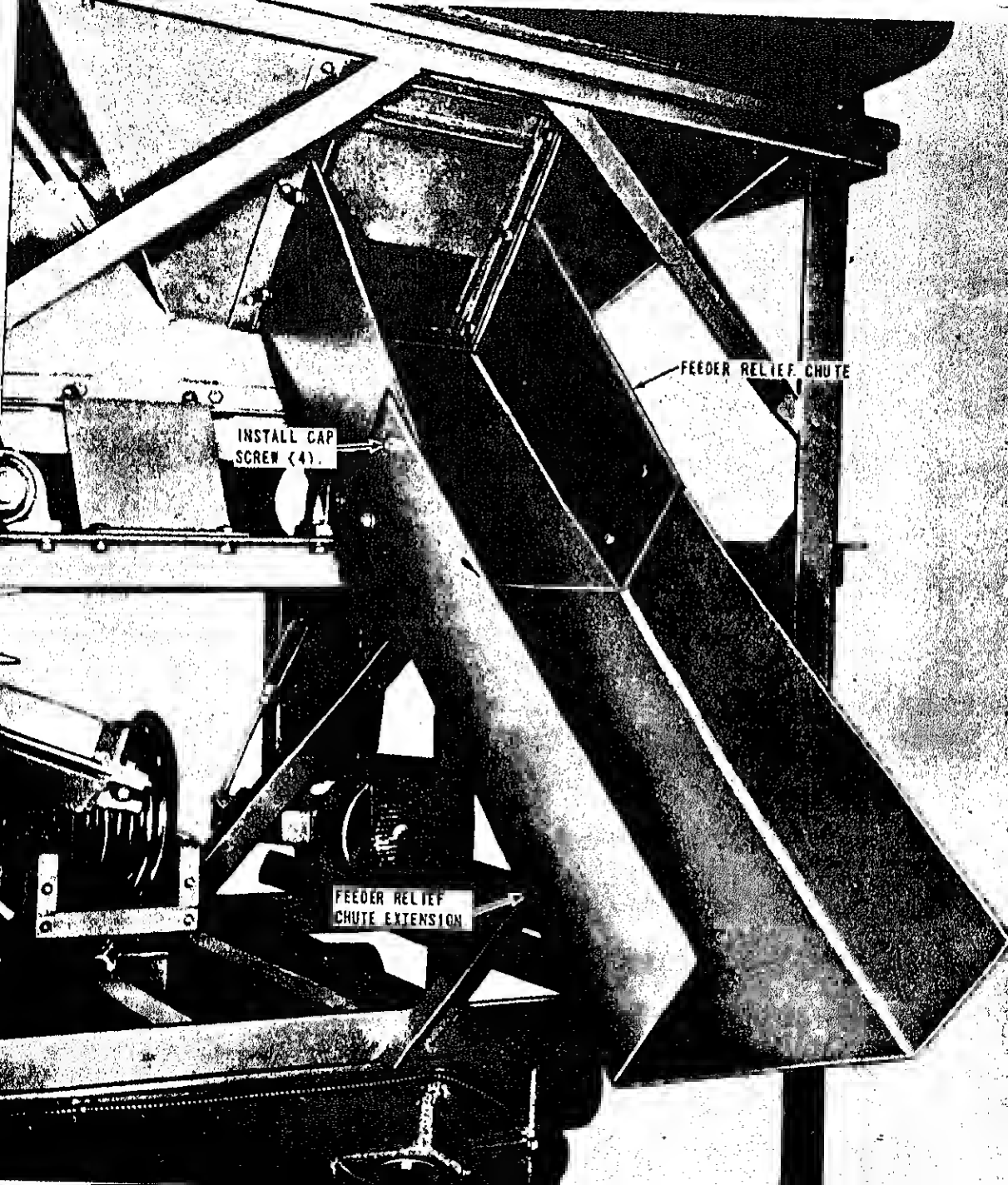


REMOVE CAPSCREW (4).

RELIEF CHUTE

FEEDER

STOWED POSITION OF
FEEDER RELIEF CHUTE
EXTENSION.



INSTALL CAP
SCREW (4)

FEEDER RELIEF CHUTE

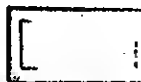
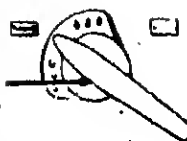
FEEDER RELIEF
CHUTE EXTENSION

CAUTION: OPEN THE MAIN CONTROL PANEL
DOOR ONLY FOR MAINTENANCE OR
FOR SETTING CIRCUIT BREAKERS.

LOOSEN W
POSITION
THE DOOR

REVERSE
Control

TURN MAIN SWITCH TO
"OFF-RESET" AS SHOWN.



OPEN THE
PANEL DOOR

ENC 38 2

Figure 11. Actuating the roll crusher electrical system.

stow the extension in reverse of the instructions on figure 10.

L. Tow the roll crusher a maximum of 20 miles per hour over-the-road or 10 miles per hour maximum cross-country to the new work-site.

Note. Refer to figure 1 and dimensions, weights, and tire p

Caution: Make certain attached and secure before

m. Install and set up tl
8).

FOURTH ELEVATOR
CIRCUIT BREAKER

UPPER CONVEYOR
CIRCUIT BREAKER

SIDE CONVEYOR NO. 2
CIRCUIT BREAKER

SIDE CONVEYOR NO. 1
CIRCUIT BREAKER

FEEDER CIRCUIT BREAKER

MAIN (FEED) CONVEYOR CIRCUIT BREAKER

VIBRATING SCREEN CIRCUIT BREAKER

NOTE: SET ALL CIRCUIT BREAKERS
IN THE "ON" POSITION BEFORE
OPERATING THE ROLL CRUSHER.
CLOSE PANEL DOOR.

10. General

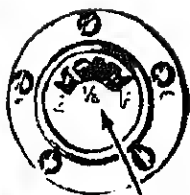
This section describes, locates, illustrates, and furnishes the operator or crew sufficient information about the various controls and instruments for proper operation of the roll crusher.

11. Controls and Instruments

The purpose, location, and use of the con-

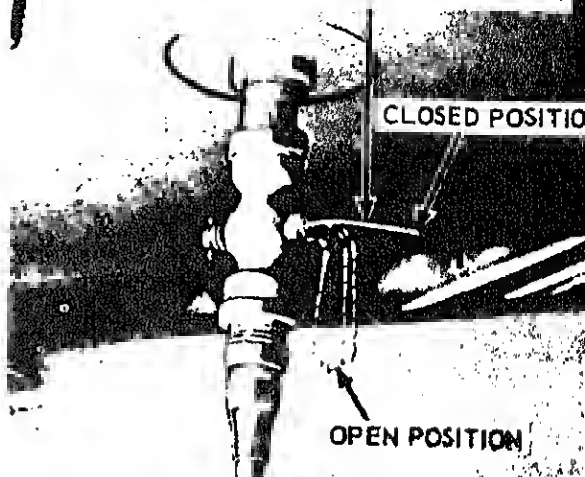
trols, and normal readings of the controls and gages are illustrated on figure

Caution: Operator's switch box properly closed and sealed to prevent from entering the box and causing controls to corrode and become unusable. All control boxes should be examined that doors are properly sealed and closed.



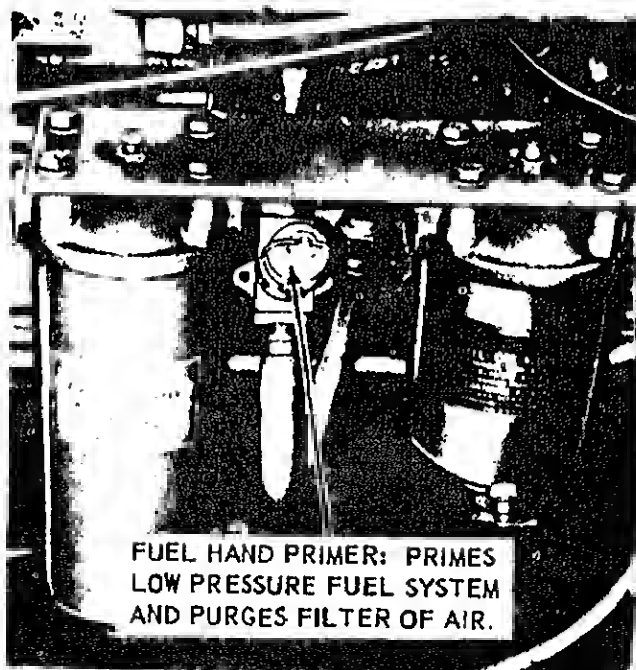
**FUEL GAGE: REGISTERS
LEVEL OF FUEL IN FUEL
TANK.**

**FUEL SHUTOFF VALVE: CONTROLS
FLOW OF FUEL FROM THE FUEL TANK.**



A

B



**FUEL HAND PRIMER: PRIMES
LOW PRESSURE FUEL SYSTEM
AND PURGES FILTER OF AIR.**

BATTERY-GENERATOR INDICATOR:
REGISTERS CONDITION OF BATTERY.

TEMPERATURE GAGE:
REGISTERS COOLANT
TEMPERATURE.

OIL PRESSURE GAGE:
REGISTERS ENGINE
OIL PRESSURE.

TACHOMETER-HOUR-METER:
RECORDS ENGINE RPM AND
RUNNING TIME.

THROTTLE LEVER:
RUN POSITION.

IGNITION SWITCH:
CONTROLS STARTING
AND STOPPING OF
ENGINE.

FILTER CLEANER INDICATOR:
INDICATES CONDITION OF
FILTER

RED SIGNAL:
EXPOSED MEANS
FILTER SERVICE
IS NECESSARY.

STARTER BUTTON:
USED TO START
ENGINE.

THROTTLE LEVER: CONTROL
ENGINE SPEED. STOP POSIT

RESET BUTTON:
UNLOCKS AND
LOWERS RED
SIGNAL.

**ETHER STARTING
AID (2):** FOR
COLD WEATHER
STARTING.

CLUTCH LEVER: ENGAGES
OR DISENGAGES CLUTCH.

ON UNITS OF EQUIPMENT WITHIN SERIAL NUMBER 6550 THROUGH 6587 ONLY.

D

MSC 3820-205-10/1/12

adjustment. Proper adjustment is 0.020 inch for intake valves and 0.024 inch for exhaust. (HOT)

20 CONTROLS AND INSTRUMENTS. Inspect for loose mounting, loose connections, and proper operation. Normal operating readings for instruments are as follows: Oil pressure gage - 55 to 65 psi, Water temperature gage - 165° to 185°F, Ammeter - green range, Tachometer - 1,400 rpm.

NOTE: OPERATIONAL TEST. During operation check for unusual noise or vibration, leaks, and proper operation.

Each trouble symptom stated is followed by a list of probable causes of the trouble. The possible remedy recommended is described opposite the probable cause. Any trouble beyond the scope of organizational maintenance shall be reported to field maintenance, 3d echelon.

22. Starter Fails to Crank Engine

<i>Probable cause</i>	<i>Possible remedy</i>
Starter switch defective.....	Replace starter switch (par. 92).
Poor electrical connection...	Clean and tighten battery cables and other electrical connections (par. 80).
Battery discharged	Replace batteries (par. 80).
Starter brushes worn.....	Replace starter brushes (par. 86).
Starter solenoid defective...	Replace starter solenoid (par. 85).

23. Engine Hard to Start or Fails to Start

<i>Probable cause</i>	<i>Possible remedy</i>
Battery charge low.....	Recharge or replace batteries (par. 80).
Fuel lines clogged	Clean fuel lines (par. 69).
Fuel injection pump defective.	Replace fuel pump. Report this condition to field maintenance, 3d echelon.
Fuel injectors dirty.....	Replace fuel injectors (par. 65).
Rocker arm clearance incorrect.	Adjust the rocker arms (par. 101).
Injection pump timing incorrect.	Time injection pump. Report this condition to field maintenance, 3d echelon.
Starter defective	Replace starter (par. 86).
Defective air cleaner.....	Repair air cleaner (par. 63).
Fuel tank valve closed.....	Open fuel tank valve.

24. Engine Misses or Runs Erratically

<i>Probable cause</i>	<i>Possible remedy</i>
Rocker arm clearance incorrect.	Adjust rocker arms (par. 101).
Fuel injectors defective.....	Replace fuel injectors (par. 65).
Fuel pump defective.....	Replace fuel pump. Report this condition to field

Engine temperature too high (safety device operated).

Oil pressure low (safety switch operated).

Engine safety switch defective.

Overspeed governor defective.

Remove and test thermostats (par. 107). Replace defective thermostats (par. 107).

Inspect for and repair leaks in oil lines (par. 75).

Replace engine safety switch (par. 91).

Replace overspeed governor (par. 90).

26. Engine Overheats

<i>Probable cause</i>	<i>Possible remedy</i>
Thermostat defective	Replace thermostats (par. 107).
Fan belts worn and slipping on pulley.	Replace fan belts (par. 104).
Injection pump timing incorrect.	Time injection pump. Report this condition to field maintenance, 3d echelon.
Back pressure in exhaust system.	Inspect for restrictions in muffler and exhaust system (par. 77).
Defective water pump.....	Replace water pump (par. 105).

27. Engine Lacks Power

<i>Probable cause</i>	<i>Possible remedy</i>
Fuel injector defective.....	Replace fuel injectors (par. 65).
Fuel injection pump defective.	Replace injection pump. Report this condition to field maintenance, 3d echelon.
Restricted fuel supply or air in system.	Remove fuel line and clean (par. 69). Bleed fuel system (TM 5-3820-205-10/2).

28. Engine Will Not Idle Smoothly

<i>Probable cause</i>	<i>Possible remedy</i>
Rocker arm clearance incorrect.	Adjust rocker arms (par. 101).
Engine operating temperature low.	Replace defective thermostat (par. 107).
Defective fuel injectors.....	Replace fuel injectors (par. 65).
Fuel pump defective.....	Replace fuel pump. Report this condition to field

rocker arm clearance incorrect.	Adjust rocker arms (par. 101).
Worn main or connecting rod bearings. Loose piston pin. Broken piston or ring, loose or worn timing gears.	Replace as necessary. Report this condition to field maintenance, 3d echelon.
Injection pump timing incorrect.	Time fuel pump. Report this condition to field maintenance, 3d echelon.

0. Engine Has Low or No Oil Pressure

<i>Probable cause</i>	<i>Possible remedy</i>
Oil pressure gage defective.	Replace gage (par. 87).
Oil pressure gage line clogged or broken.	Clean or replace oil line (par. 87).
Air in oil cooler bypass valve or broken spring.	Clean valve and replace spring if necessary (par. 72).
Oil too light or diluted.	Drain and replace with recommended grade lubricant. Refer to LO 5-3820-205-20/2.

1. Exhaust Smoke Excessive

<i>Probable cause</i>	<i>Possible remedy</i>
Engine temperature low.	Replace thermostat (par. 106).
Fuel injectors defective.	Replace fuel injectors (par. 65).
Poor grade diesel fuel.	Drain fuel system and replace with proper grade fuel.
Worn or stuck rings, or worn valve guides and seals.	Replace as necessary. Report to field maintenance, 3d echelon.
Restriction in air supply.	Check and clean air cleaner (TM 5-3820-205-10/2).

2. High Oil Consumption

<i>Probable cause</i>	<i>Possible remedy</i>
Oil leaks.	Locate and repair leaks (par. 87).
Too high oil level maintained.	Check oil level and fill to indicated full mark on bayonet gage.
Incorrect grade of oil.	Refer to current lubrication order and fill with proper grade of oil.

Generator brushes worn or generator defective.	Replace brushes with proper level with distilled water (par. 80).
Generator regulator defective.	Replace generator brushes (par. 91). Test and replace generator regulator (par. 83).
Connections in wiring shorted or loose.	Check all wiring for shorts or loose connections (par. 83 and 84).

34. Power Takeoff Clutch Slips or Grabs

<i>Probable cause</i>	<i>Possible remedy</i>
Clutch out of adjustment.	Adjust clutch (TM 5-3820-10/2).
Worn clutch plate lining, broken throwout yoke or springs, oil soaked lining. Warped clutch plates.	Replace as necessary. Report this condition to field maintenance, 3d echelon.

35. Discharge Conveyor Inoperative

<i>Probable cause</i>	<i>Possible remedy</i>
Conveyor electric motor belts worn or broken.	Replace worn or broken belts (par. 129).
Drive sheave on conveyor motor or gear reducer defective.	Replace defective sheave (par. 159).
Defective gear reducer.	Replace defective gear reducer (par. 159).
Electric motor starting switch defective or defective wiring.	Replace electric motor starting switch (par. 129). Repair defective wiring (par. 129).

36. Grooves or Cuts Appearing in Conveyor Belt

<i>Probable cause</i>	<i>Possible remedy</i>
Discharge conveyor hopper hitting belt.	Replace or repair hopper. Report to field maintenance, 3d echelon.
Rocks wedged between side or back of discharge conveyor and belt.	Remove rocks.
Rock or gravel sticking to head belt scraper and return idler rollers.	Clean out rock or gravel.
Roller on idler not	Check idlers for tight rollers.

Crusher overloaded ----- Slow down pan feeder, especially when heavy hard stone is being crushed.

38. Material Piling on Screen Under Grizzly

<i>Probable cause</i>	<i>Possible remedy</i>
Worn or slipping drive belts.	Adjust or replace drive belts (par. 128).
Defective electric motors.	Inspect and replace electric motor if necessary (par. 128).
Defective rubber mounting.	Replace rubber mounting (par. 151).
Defective drive sheave or key.	Replace sheave and key (par. 128).

39. Insufficient Production

<i>Probable cause</i>	<i>Possible remedy</i>
Crusher running too slow.	Speed up engine rpm.
Corrugation worn smooth on lower end of jaws.	Jaws should be reversed. Report this condition to field maintenance, 3d echelon.
Oversized rock being fed to crusher.	Feed smaller rock by scalping off the larger rocks before loading.

40. Pan Feeder Not Operating Properly or Inoperative

<i>Probable cause</i>	<i>Possible remedy</i>
Drive belts slipping or broken.	Replace drive belts (par. 127).
Defective electric motor.	Replace electric motor (par. 127).
Defective feeder drive gear assembly.	Repair feeder drive gear assembly. Report to field maintenance, 3d echelon.
Defective or damaged bars, pins, or rollers.	Replace bars, pins, and rollers (par. 115).
Bars wedged between feeder hopper chain belt.	Remove rocks.
Accumulation of dirt and sand in rollers and improper lubrication.	Clean chain belt and lubricate (L.O. 5-3820-207-20 2).

41. Pan Feeder Hydraulic

Insufficient, dirty, or improper grade hydraulic fluid. Replace damaged cylinder or O-rings. (par. 137).
 Check fluid in oil tank, drain, flush and refill with proper grade fluid. (T 5-3820-205-10/2).
 Damaged or leaking oil tank. Replace oil tank (par. 130).

42. Tail and Marker Lights Inoperative

<i>Probable cause</i>	<i>Possible remedy</i>
Burned out lamp.	Replace lamp (pars. 112, 123, 124, and 125).
Defective wiring.	Repair or replace wiring (pars. 111 and 123).
Defective trailer electrical coupling or receptacle.	Repair or replace coupling or receptacle (par. 110).

43. Brakes Faulty

<i>Probable cause</i>	<i>Possible remedy</i>
Slack adjusters out of adjustment.	Adjust slack adjusters (par. 174).
Defective brake hose, lines, or fittings.	Replace hose (par. 142). Repair or replace line or fittings (par. 143).
Worn or oil soaked brake assemblies.	Replace brake assemblies (par. 175).
Defective air chamber.	Replace air chamber (par. 139).
Damaged or defective relay valve.	Replace relay valve (par. 140).
Clogged or defective air filters.	Service air filters (TM 5-3820-205-10/2) or replace air filters (par. 141).
Leaking or damaged air tank or fittings.	Replace air tank or fittings (pars. 142 and 143).

44. Unable to Adjust Moveable Jaw

<i>Probable cause</i>	<i>Possible remedy</i>
Broken or defective adjusting worm and gears.	Replace worm and gears. Report this condition to field maintenance, 3d echelon.
Broken toggle plate.	Replace toggle plate. Report to field maintenance, 3d echelon.

45. Crusher Vibrates Excessively

and where supplies and repair parts are not available and normal corrective action cannot be performed. When this condition exists, the following expedient repairs may be used in emergencies, upon the decision of the unit commander. Equipment so repaired must be removed from operation as soon as possible and properly repaired before being placed in operation again.

1. Engine Stops or Runs Erratically

<i>Trouble</i>	<i>Expedient remedy</i>
Clogged fuel filter.....	Removed clogged filter element (par. 67). Connect fuel lines together bypassing filters.

Section VI. RADIO INTERFERENCE SUPPRESSION

1. General Methods Used to Attain Proper Suppression

Essentially suppression is attained by providing a low resistance path to ground for stray currents. The methods used include shielding the ignition and high-frequency wires, grounding the frame with bonding straps, and using capacitors and resistors. For general information on radio interference suppression, see TM 11-483.

2. Interference Suppression Components

a. *Primary Suppression Components.* The engine-to-frame bonding strap is illustrated on figure 9.

b. *Secondary Suppression Components.*

(1) *Tooth-type lockwashers.* Tooth-type lockwashers are used to assure a good metal-to-metal contact where electrical components are mounted.

(2) *Shielded cable.* The generator is equipped with a shielded cable connecting the generator and generator regulator.

3. Replacement of Suppression

housing (par. 107) operate without the stat.

49 Conveyors Will Not Operate When Start Button is Depressed

<i>Trouble</i>	<i>Expedient remedy</i>
Defective START and STOP electrical motor pushbutton control.	Remove electrical wire from rear of defective pushbutton (par. 131) contact wires directly, passing the button. Operate motors from main electrical control panel until a new pushbutton can be obtained.

ing the bolt (5), washers (6), and nut that secure it to the timing gear cover (1) on the engine frame (4). Install a new bonding strap and mounting hardware. Be certain a good metal-to-metal contact.

b. *Secondary Suppression Components.*

(1) *Tooth-type lockwashers.*

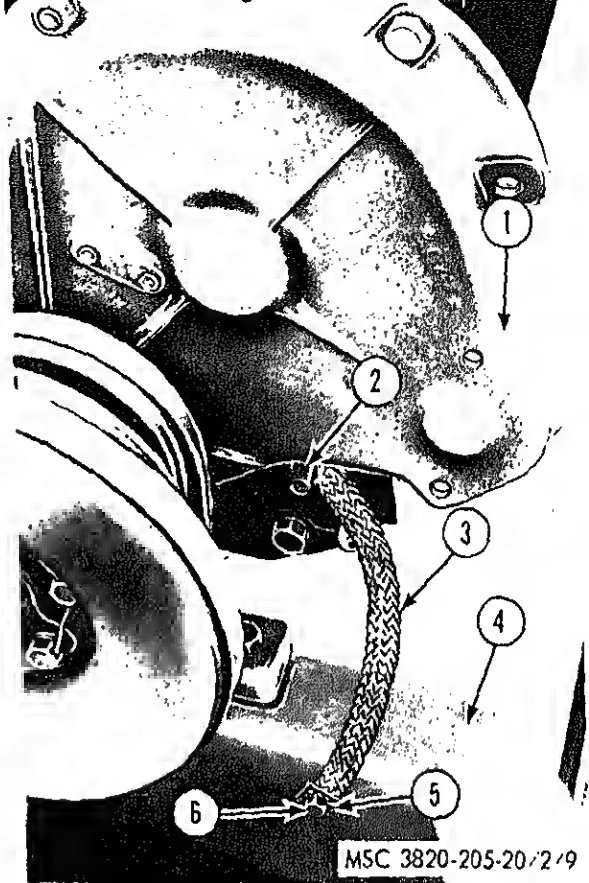
(a) If proper suppression is to be maintained, it is necessary that a good metal-to-metal contact is obtained by tightening the mounting hardware employing tooth-type lockwashers.

(b) For replacement of tooth-type lockwashers, refer to paragraphs 83, 84, and 86.

(2) *Shielded cable.* Replace the shielded generator-to-generator regulator cable (pars. 83 and 84).

53. Testing of Radio Interference Suppression Components

Test the capacitors for leaks and shorts with a capacitor tester; replace defective capacitors. If test equipment is not available and interference is indicated, isolate the cause of in-



- 1 Timing gear cover
- 2 Nut, $\frac{1}{8}$ -18
- 3 Bonding strap

- 4 Engine frame
- 5 Bolt, machine, $\frac{1}{8}$ -18 x $\frac{3}{4}$ in.
- 6 Washer, lock, E.T., $\frac{1}{16}$ in.

Figure 9. Radio interference suppression components.

CHAPTER 4

ENGINE MAINTENANCE INSTRUCTIONS

Section I. MANUAL AND MECHANICAL CONTROLS AND INSTRUMENTS

a. General

The location and purpose of the controls and instruments are given in TM 5-3820-205-10-2.

b. Engine Clutch Levers

a. Removal. Remove the two engine clutch levers as instructed on figure 10.

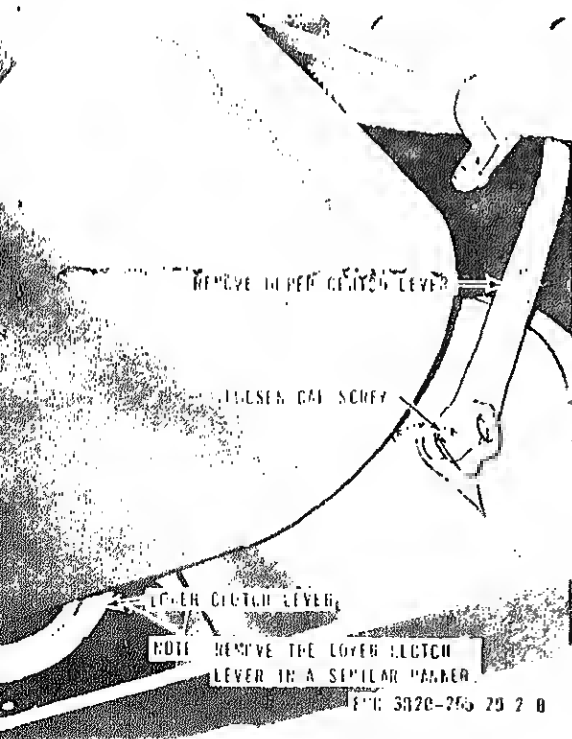


Figure 10. Engine clutch levers, removal and installation.

56. Throttle Control Lever

a. Removal.

- (1) Disconnect the throttle control cable from the fuel injection pump as instructed on figure 11.
- (2) Remove the throttle control lever from the instrument panel as instructed on figure 12.

b. Cleaning and Inspection. Clean and inspect all parts for damage. Replace as necessary.

c. Installation.

- (1) Install the throttle control lever on the instrument panel in reverse of instructions on figure 12.
- (2) Connect the throttle control cable to the fuel injection pump as instructed on figure 11.

57. Tachometer-Hourmeter and Drive

a. Removal. Remove the tachometer-hourmeter and drive from the instrument panel as instructed on figure 11 and 12.

b. Disassembly. Disassemble the tachometer drive as illustrated on figure 13.

c. Cleaning, Inspection, and Repair.

- (1) Clean all parts in an approved cleaning solvent and dry thoroughly.
- (2) Inspect the tachometer-hourmeter for broken glass, and defective drive cable. Replace a defective tachometer-hourmeter and drive cable.
- (3) Inspect the tachometer drive

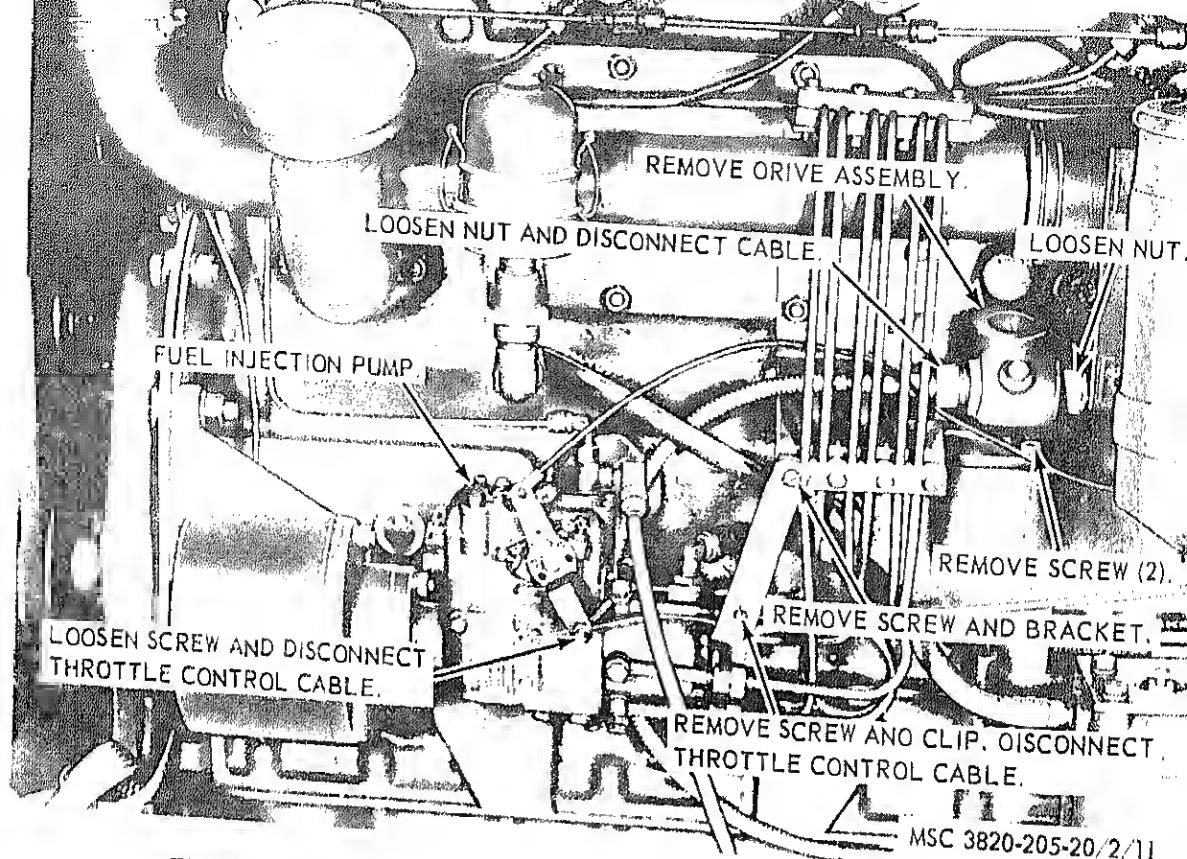


Figure 11. Throttle control cables and tachometer drive, removal and installation.

c. *Installation.* Install the tachometer-hour-meter and drive on the instrument panel and engine in reverse of the instructions on figures 11 and 12.

58. Fuel Gage

a. *Removal.* Remove the fuel gage as instructed on figure 14.

b. *Cleaning and Inspection.* Clean and inspect the fuel gage for damage. Replace a damaged gage.

c. *Installation.* Install the fuel gage in reverse of instructions on figure 14.

59. Fuel Pumps

a. *Removal.*

spect all parts for damage. Replace if necessary.

c. *Installation.*

(1) Install the fuel primer and secondary fuel filter in reverse of instructions on figure 15.

(2) Bleed the fuel system (TM 5-3820-205-10/2).

60. Air Cleaner Indicator

a. *Removal.* Remove the air cleaner indicator as instructed on figure 16.

b. *Cleaning and Inspection.* Clean and inspect all parts. Inspect the air cleaner

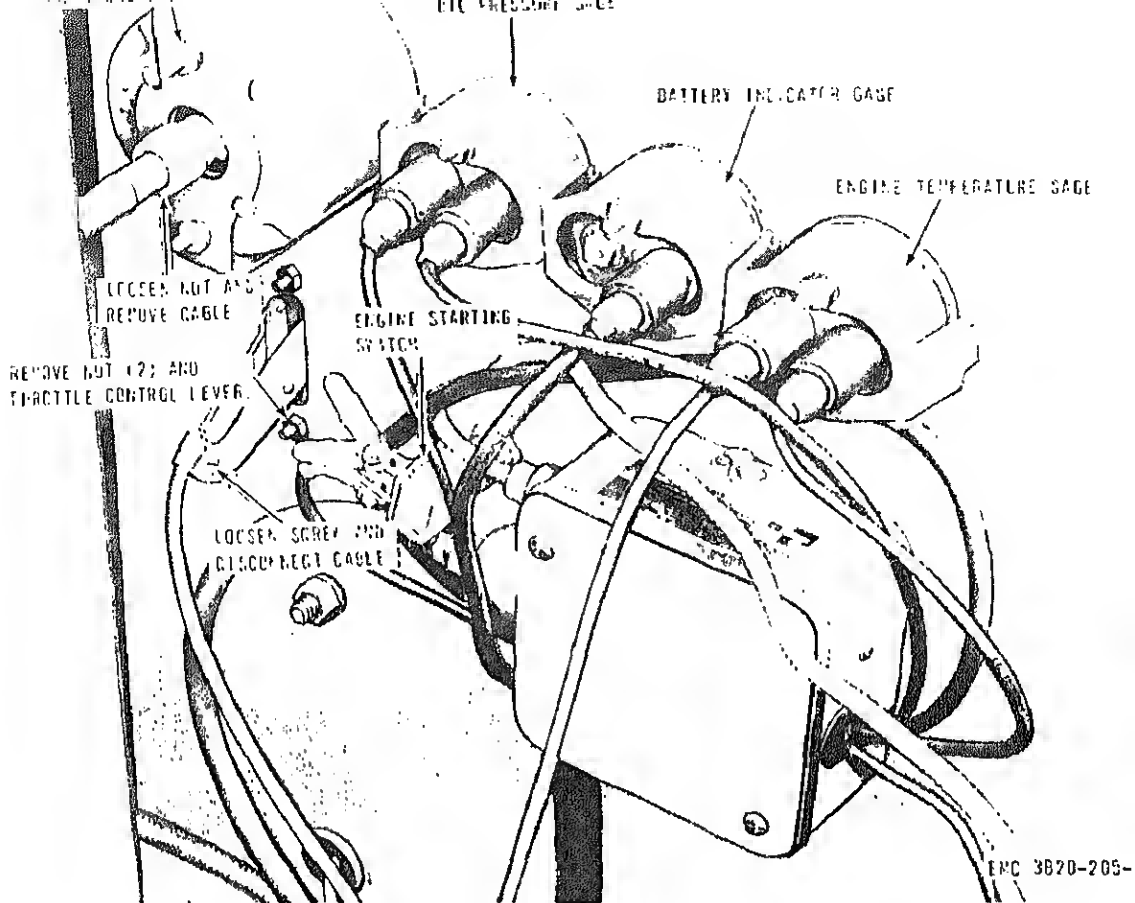


Figure 12. Instrument panel, rear view.

61. Hand Cranking Assembly

a. Removal. Remove the hand cranking assembly from the engine as instructed on figure 17.

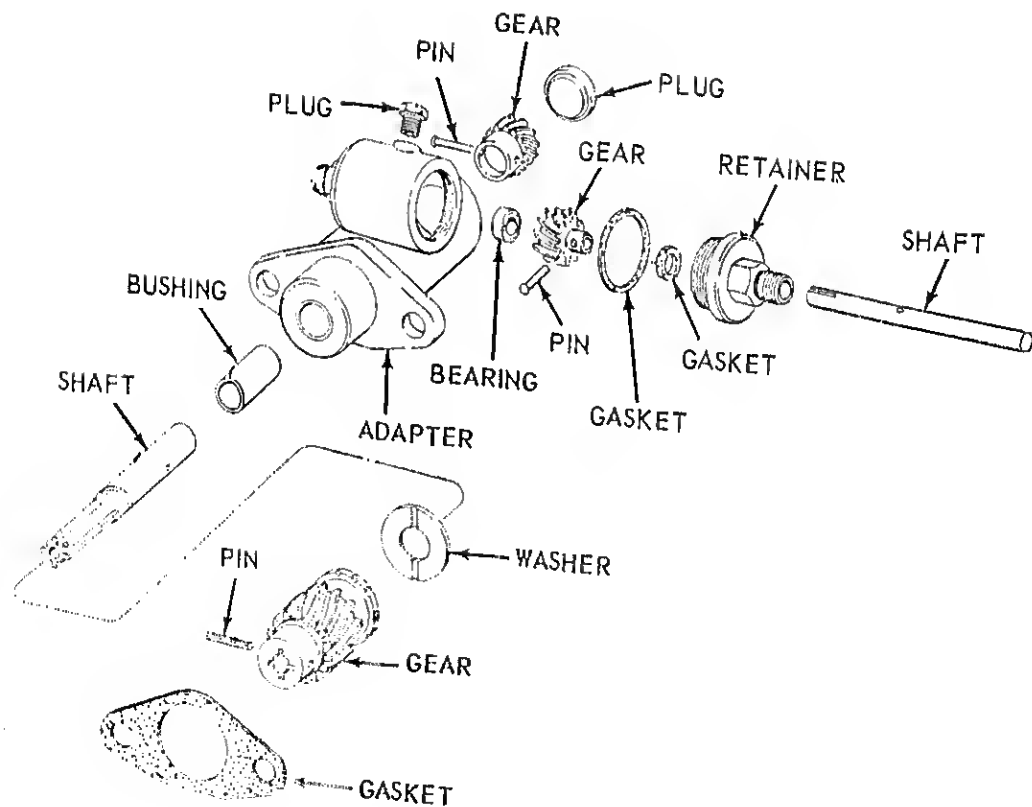
d. Disassembly. Disassemble the hand cranking assembly as illustrated on figure 18.

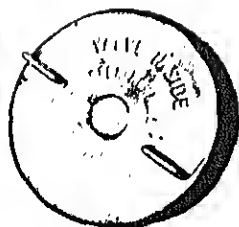
c. Cleaning, Inspection, and Repair. Clean

and inspect. Replace or repair worn, damaged, or defective parts as necessary.

d. Reassembly. Reassemble the hand cranking assembly illustrated on figure 18.

e. Installation. Install the hand cranking assembly on the engine in reverse of the instructions on figure 17.





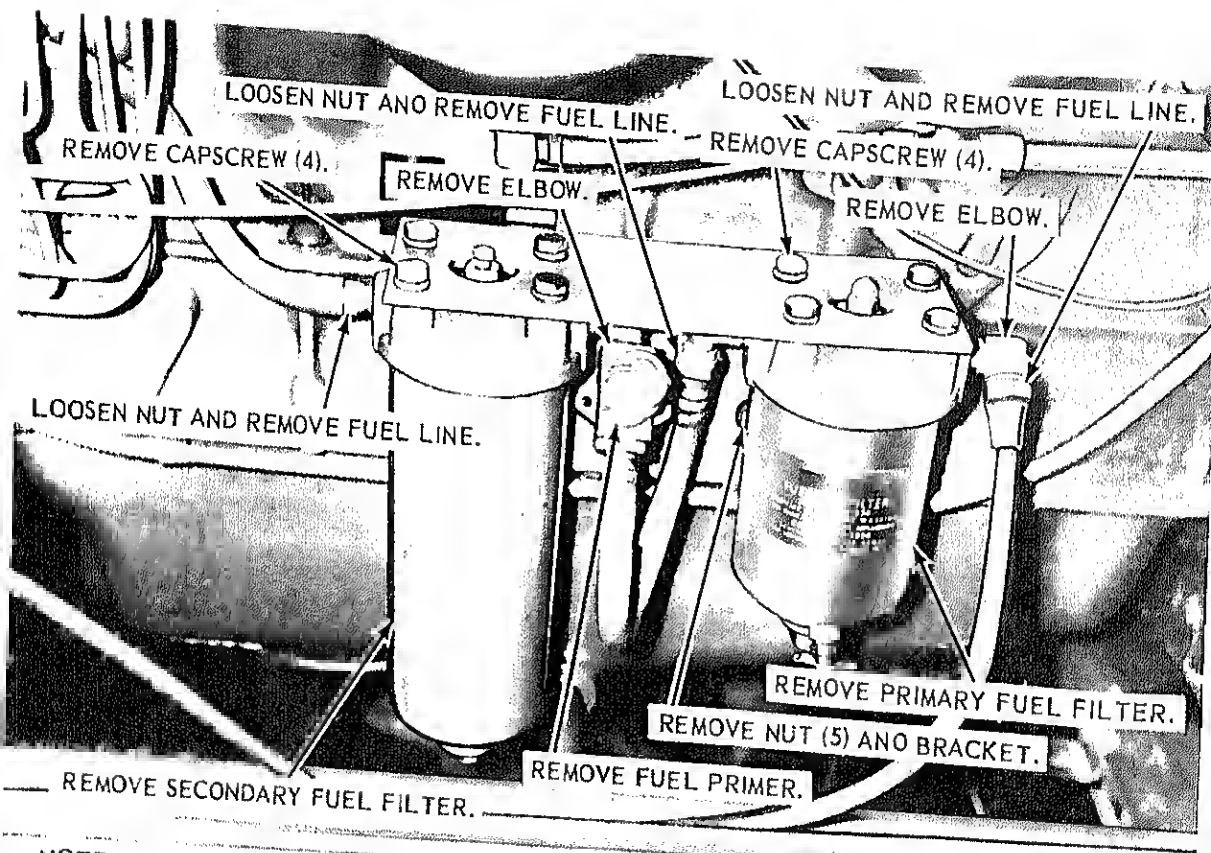
REMOVE SCREW (5).



REMOVE FUEL GAGE AND GASKET.

EMC 3820-205-20/2

Figure 14. Fuel gage, removal and installation.



NOTE. THE SECONDARY FUEL FILTER MUST BE REMOVED TO REMOVE THE FUEL PRIMER.

NOTE. DRAIN PRIMARY FUEL FILTER.

MSC 3820-205-20/2/15

Figure 15. Fuel primer and fuel filters, removal and installation.

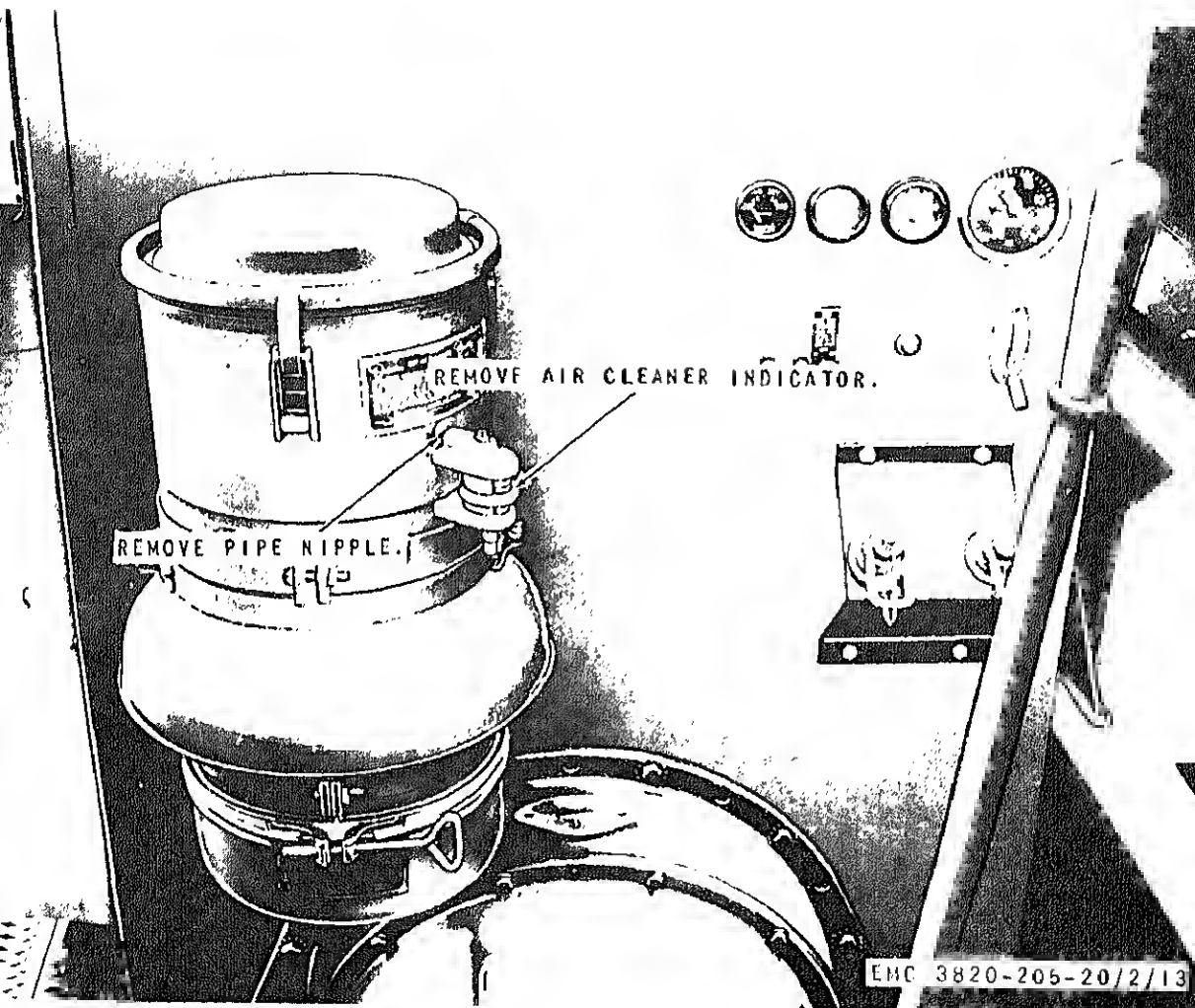


Figure 16. Air cleaner indicator, removal and installation.

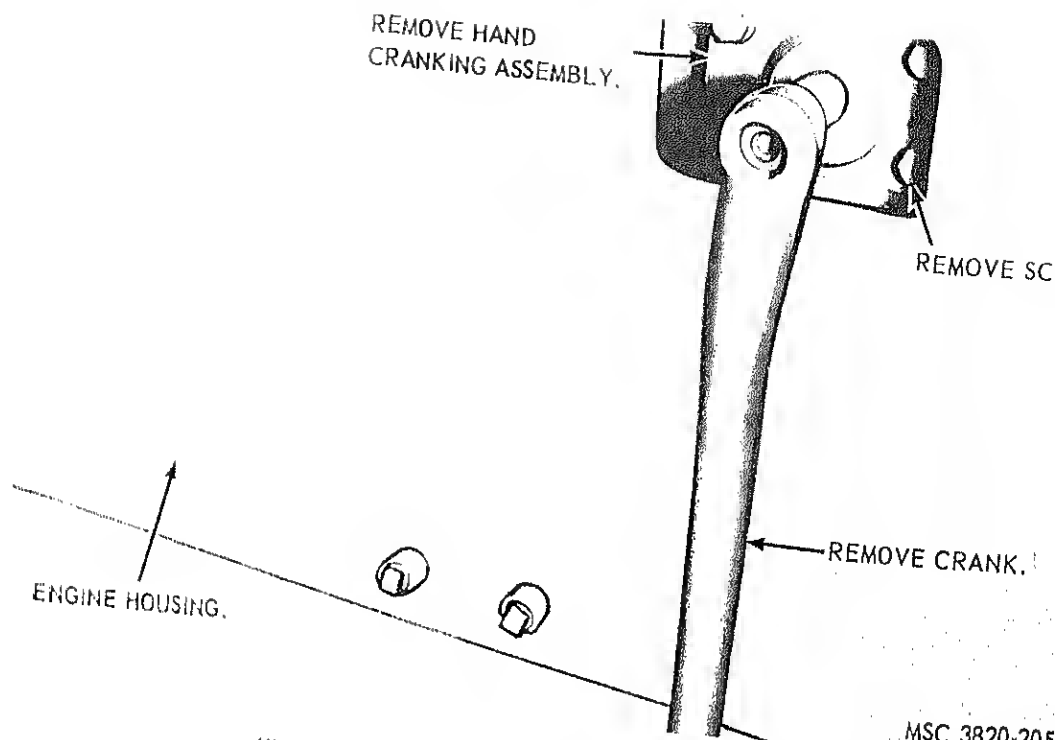
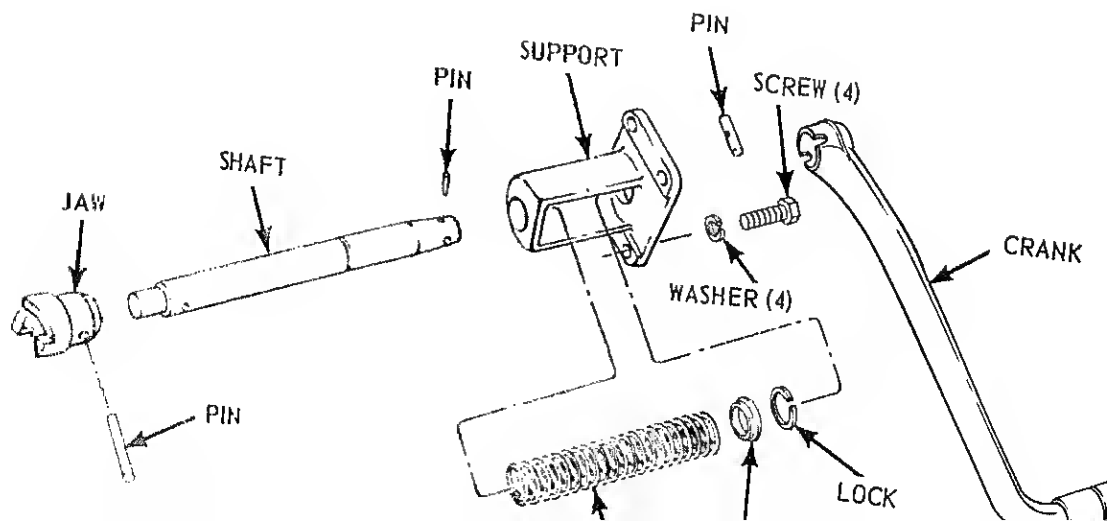


Figure 17. Hand cranking assembly, removal and installation.



The diesel fuel system consists of a 100-gallon fuel tank, primary fuel filter, secondary fuel filter, fuel primer, fuel injection pump, engine overspeed governor, fuel injectors, air cleaner, intake manifolds, ether starting aids, and the necessary lines and fittings for distributing the diesel fuel to the components of the fuel system.

3. Air Cleaner

a. Removal. Remove the air cleaner and pipe as instructed on figure 19.

b. Disassembly.

- (1) Remove the air cleaner indicator (par. 60).
- (2) Disassemble the air cleaner as illustrated on figure 20.

c. Cleaning, Inspection, and Repair. Clean and inspect all parts. Replace gaskets. Repair or replace all damaged parts.

d. Reassembly.

- (1) Reassemble the air cleaner as illustrated on figure 20.
- (2) Install the air cleaner indicator (par. 60).

e. Installation. Install the air cleaner and pipe in reverse of instructions on figure 19.

4. Intake Manifolds

a. Removal.

- (1) Remove the air cleaner pipe (par. 63).
- (2) Remove the two intake manifolds as instructed on figure 21.

b. Cleaning and Inspection. Clean and inspect all parts. Replace any damaged or defective parts.

c. Installation.

- (1) Install the two intake manifolds in reverse of instructions on figure 21.

Note. Correct torque for manifold nuts is 50-55 foot-pounds.

- (2) Install the air cleaner pipe (par. 63).

an injector nozzle valve sticking open in cylinder which immediately precedes that cylinder in the engine firing order. During injection to the cylinder which has the nozzle valve sticking open, fuel rushes into that cylinder with no restriction, causing a scavenging effect in the pump distributor rotor. This causes a partial loss in fuel pressure to the following injector, the nozzle fails to open, and combustion does not occur in that cylinder.

b. On-Equipment Testing.

- (1) Start and operate engine at idle speed (TM 5-3820-205-10/2).
- (2) Momentarily loosen injector fuel line assembly (fig. 5) on each injector in turn. Note fuel injector where loosening of fuel line assembly causes effect on engine operations.

Warning: Keep hands away from escaping fuel spray when loosening injector fuel line assemblies.

- (3) Stop the engine and replace the injector noted in (2) above.
- (4) Start the engine as in (1) above. If the operation is still erratic, determine the firing order (par. 4b) and replace injector that injects immediately prior to fuel injector found in (2) above.

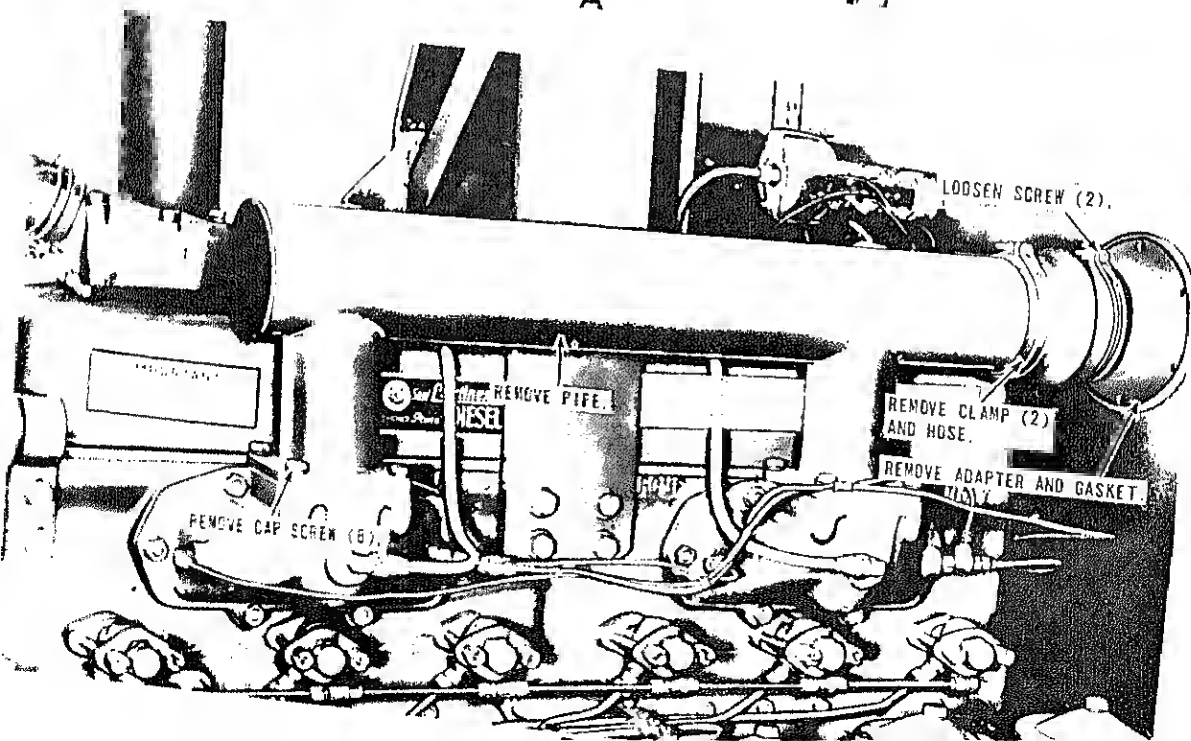
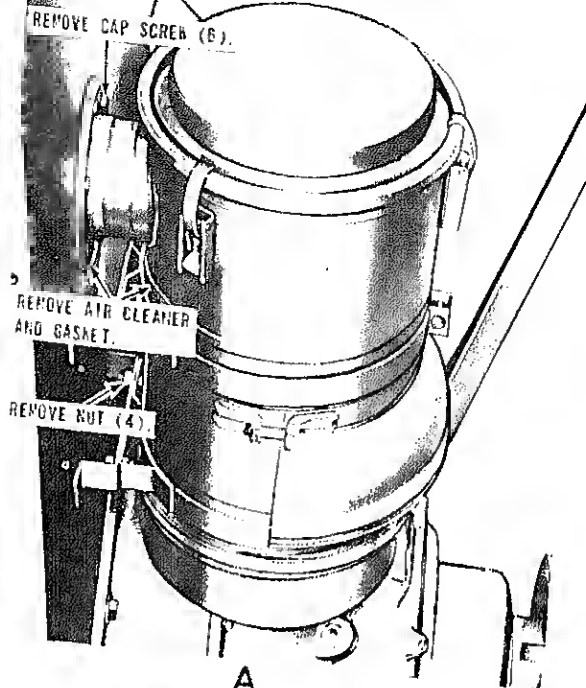
c. Removal. Remove the six fuel injectors as instructed on figure 21.

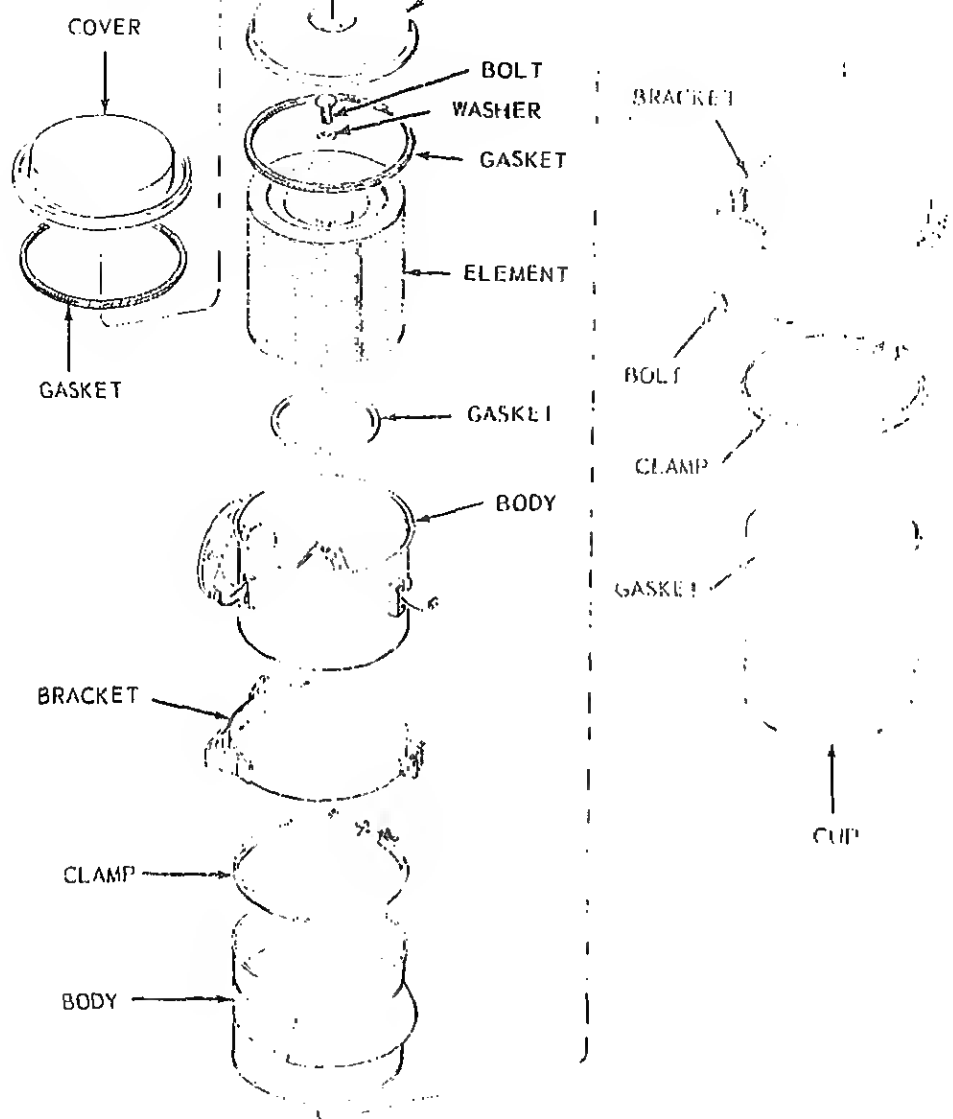
d. Cleaning and Inspection. Clean and inspect all parts. Replace the gaskets and damaged parts.

e. Installation. Install the fuel injectors in reverse of instructions on figure 21.

f. Testing.

- (1) Remove one fuel injector from engine, leaving the fuel line connected to the fuel injection pump.
- (2) Start the engine (TM 5-3820-205-10/2).
- (3) Hold a target 12 inches from the





MSC 3820-205-20 2 20 (1)

1 Serial Nos. 2050 through 2057

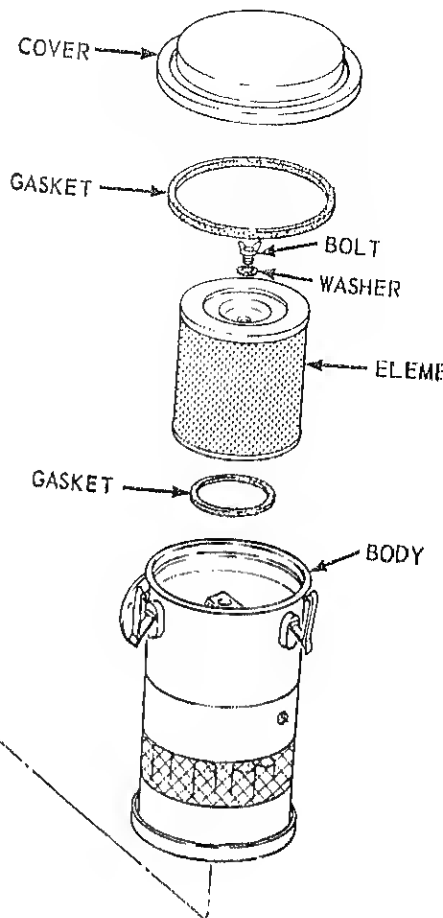
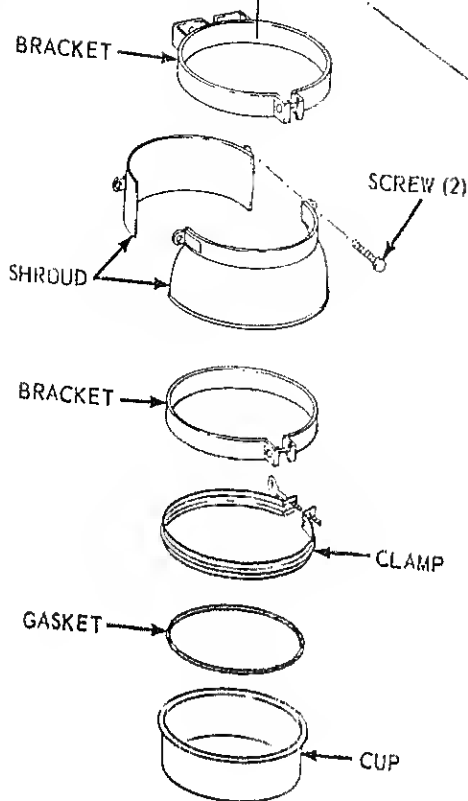
Figure 20. Air cleaners, exploded view.

- (5) Test the remaining fuel injectors in a similar manner.
- (6) Stop the engine (TM 5-3820-205-

66. Ether Starting Aids

a. Removal.

- (1) Remove the ether starting aid.



Serial Nos. 2800 through 2128
Figure 20—Continued.

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e. Installation.

- (1) Install the ether starting aid lines on the intake manifold (par. 64).
- (2) Install the ether starting aids and bracket in reverse of instructions on figure 22.

67. Fuel Filters

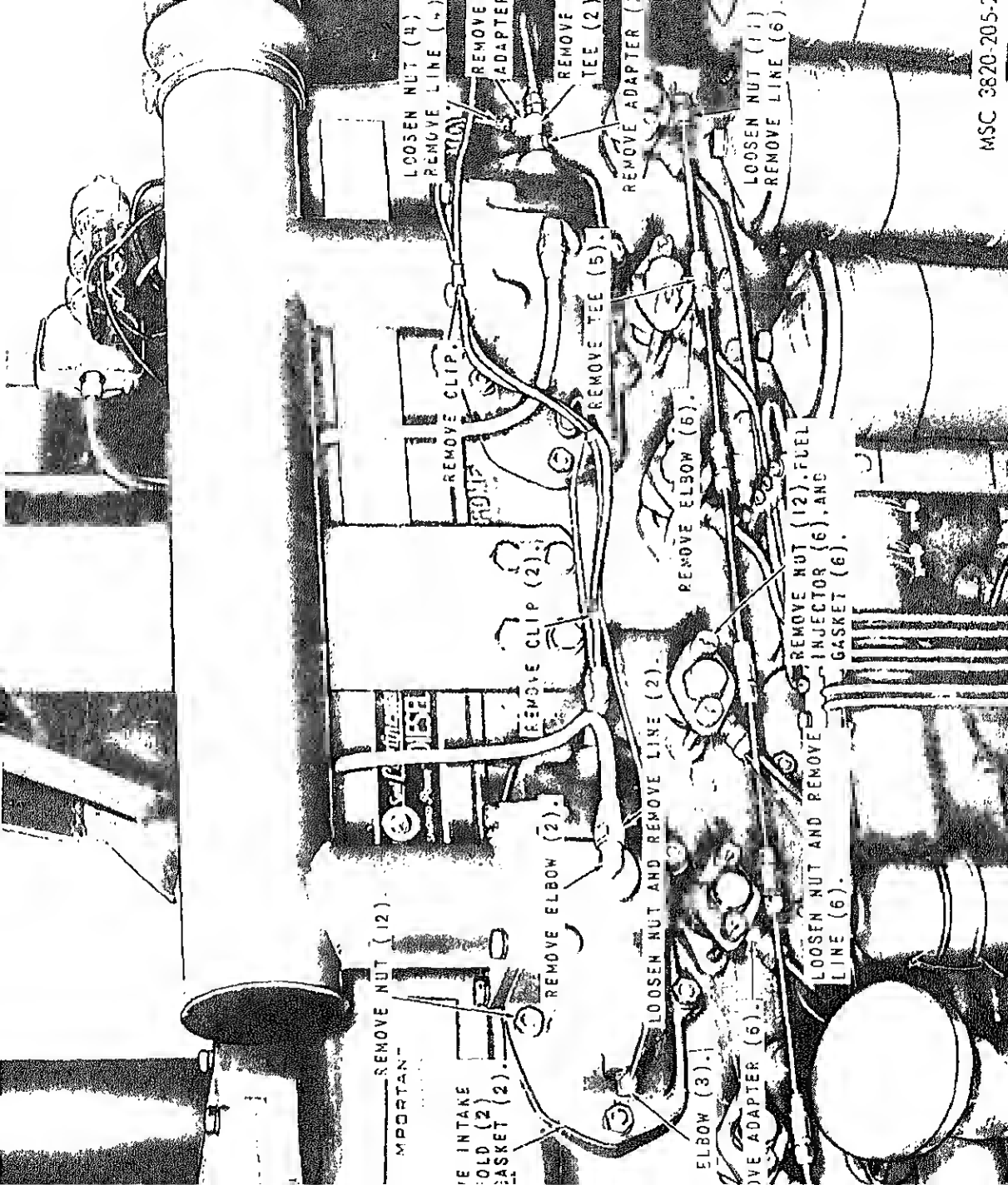
a. Removal. Remove the primary and secondary fuel filters as instructed on figure 15.

b. Cleaning and Inspection. Clean and inspect all parts. Replace as necessary.

68. Fuel Tank and Cap

a. Removal.

- (1) Remove the fuel gage (par. 58).
- (2) Remove the fuel tank cap and strainer (TM 5-3820-205-10/2).
- (3) Remove the clearance marker light (par. 125).
- (4) Remove the fuel tank and bracket as illustrated on figure 22.



REMOVE NUT (12).

IMPORTANT -

REMOVE INTAKE
OLD (2)
GASKET (2).

REMOVE ELBOW (2).

LOOSEN NUT AND REMOVE LINE (2).

ELBOW (3).

REMOVE ADAPTER (6).

LOOSEN NUT AND REMOVE
LINE (6).

REMOVE NUT (12), FUEL
INJECTOR (6), AND
GASKET (6).

REMOVE CLIP.

REMOVE CLIP (2).

REMOVE TEE (5).

REMOVE ELBOW (6).

REMOVE ADAPTER (1).

REMOVE
TEE (2).

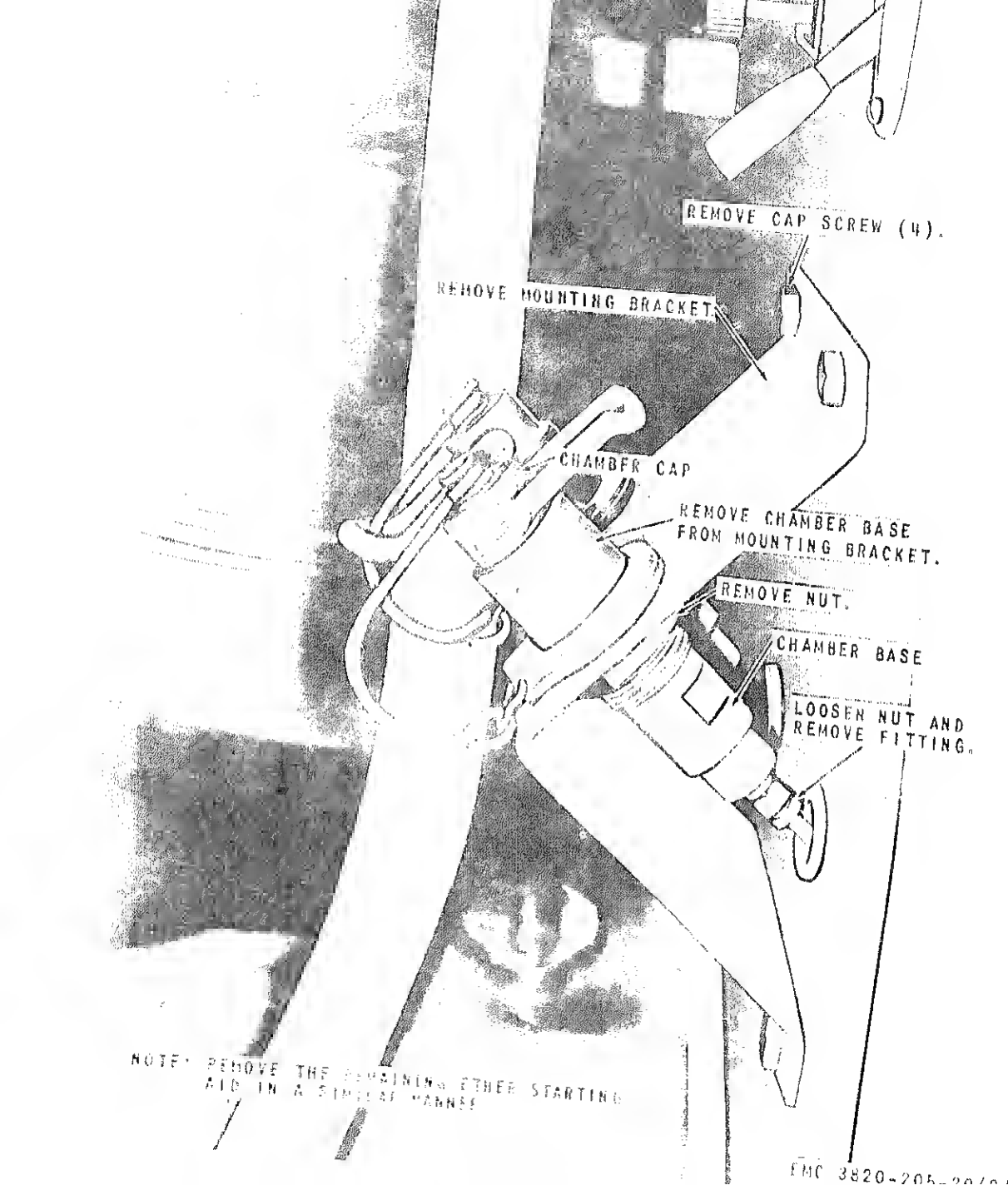
REMOVE
ADAPTER

LOOSEN NUT (4).

REMOVE LINE (4).

LOOSEN NUT (11).

REMOVE LINE (6).



REMOVE CAP SCREW (4).

REMOVE MOUNTING BRACKET.

CHAMBER CAP

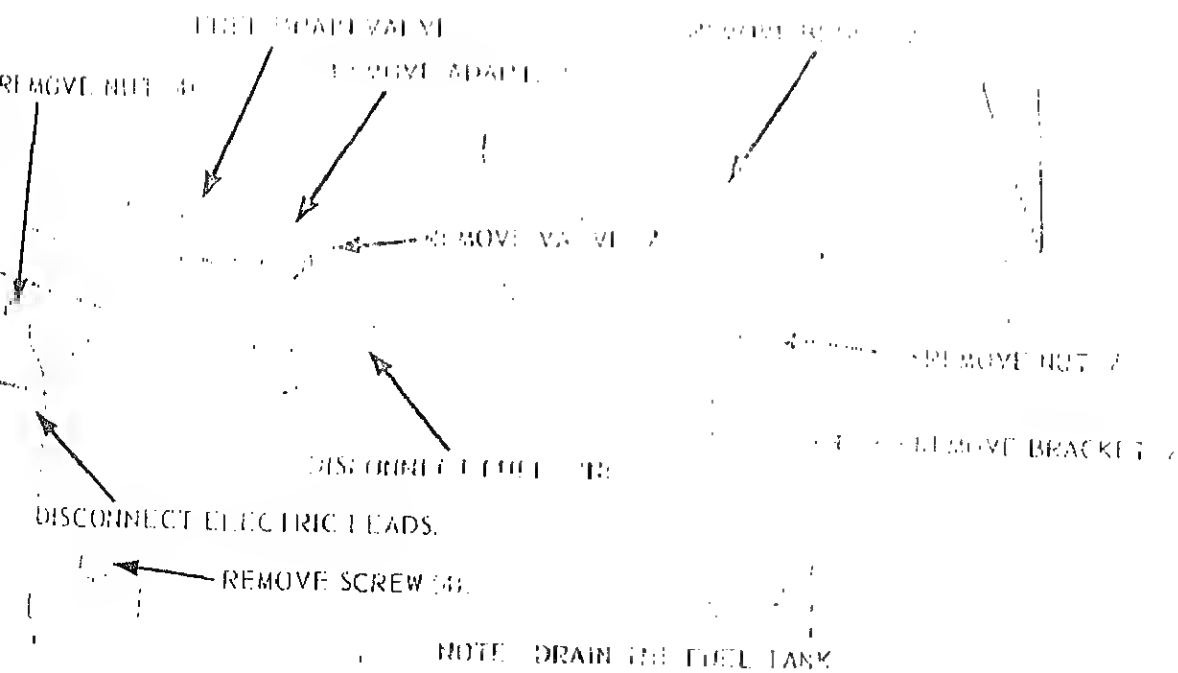
REMOVE CHAMBER BASE
FROM MOUNTING BRACKET.

REMOVE NUT.

CHAMBER BASE

LOOSEN NUT AND
REMOVE FITTING.

NOTE: REMOVE THE REMAINING OTHER STARTING
AID IN A SIMILAR MANNER



fuel tank cap and strainer (par. 50, 55-10 2).

fuel gage (par. 58).

Removal and Fittings

Remove the fuel lines from the fuel tank (par. 58).

Remove the fuel lines from the fuel tank (par. 59).

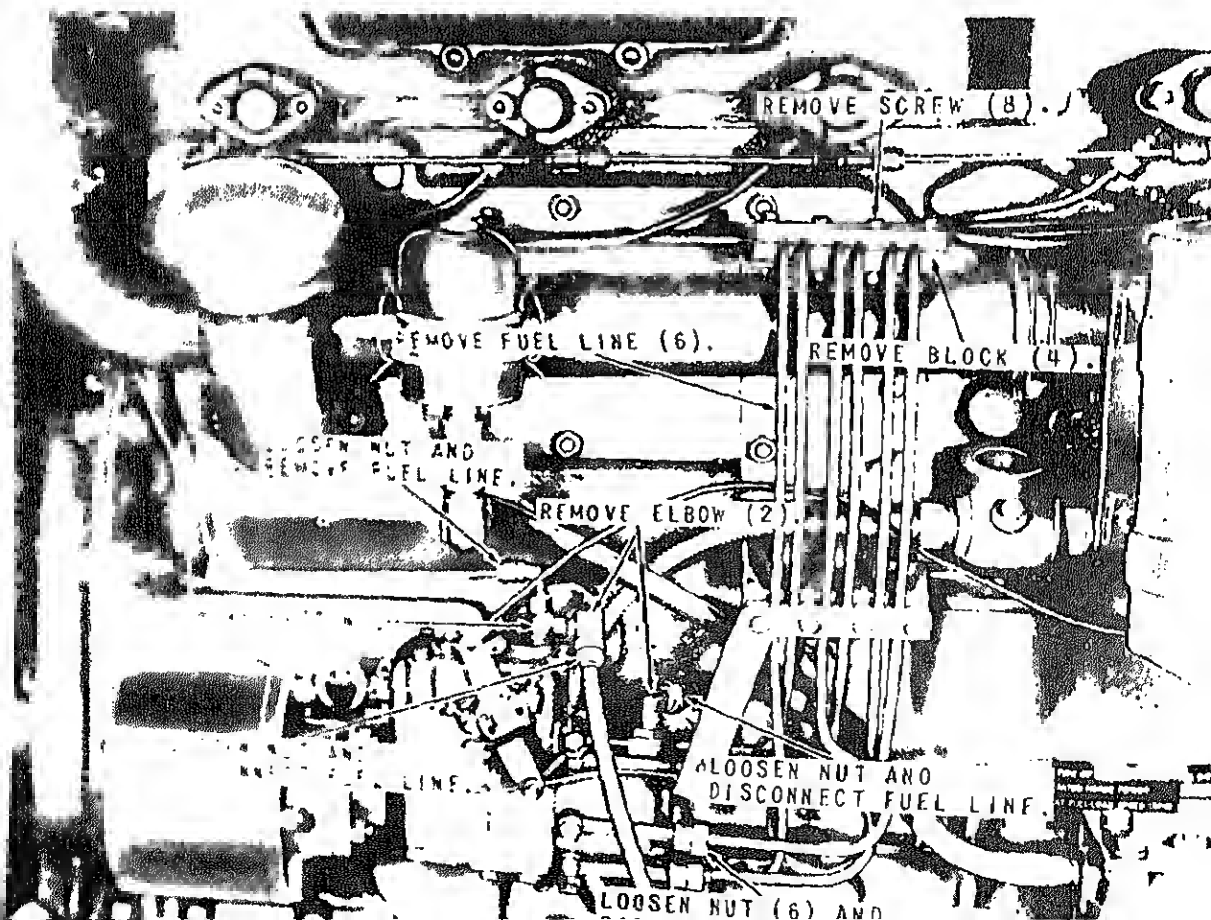
Remove the fuel lines from the fuel tank (par. 60).

Remove the fuel lines from the fuel tank (par. 61).

b. *Cleaning, Inspection, and Repair.* Clean and inspect all parts. Repair or replace damaged parts.

c. Installation.

- (1) Connect the fuel lines to the fuel injector pump in reverse of instructions on figure 24.
- (2) Connect the fuel lines to the fuel injectors (par. 65).
- (3) Connect the fuel lines to the fuel filters (par. 67).
- (4) Connect the fuel lines to the fuel primer (par. 59).



screws (fig. 5) are loosened when connecting the line assemblies, new wash-

will crush the copper gaskets allowing the screws to bottom.

Section III. ENGINE LUBRICATION SYSTEM

I. General

The engine lubrication system is a pressure-type. A gear-type oil pump attached to the bottom of the engine crankcase provides oil under pressure from the engine oil pan to the moving parts of the engine. The oil cooler bypass valve allows the engine oil to continue to flow through the lubrication system should the oil cooler become clogged. The engine oil is filtered by three oil filters.

II. Oil Filters and Mounting Bracket

a. Removal. Remove the oil filters and mounting bracket as instructed on figure 25.

b. Cleaning and Inspection. Clean and inspect the oil filters and bracket. Replace damaged parts.

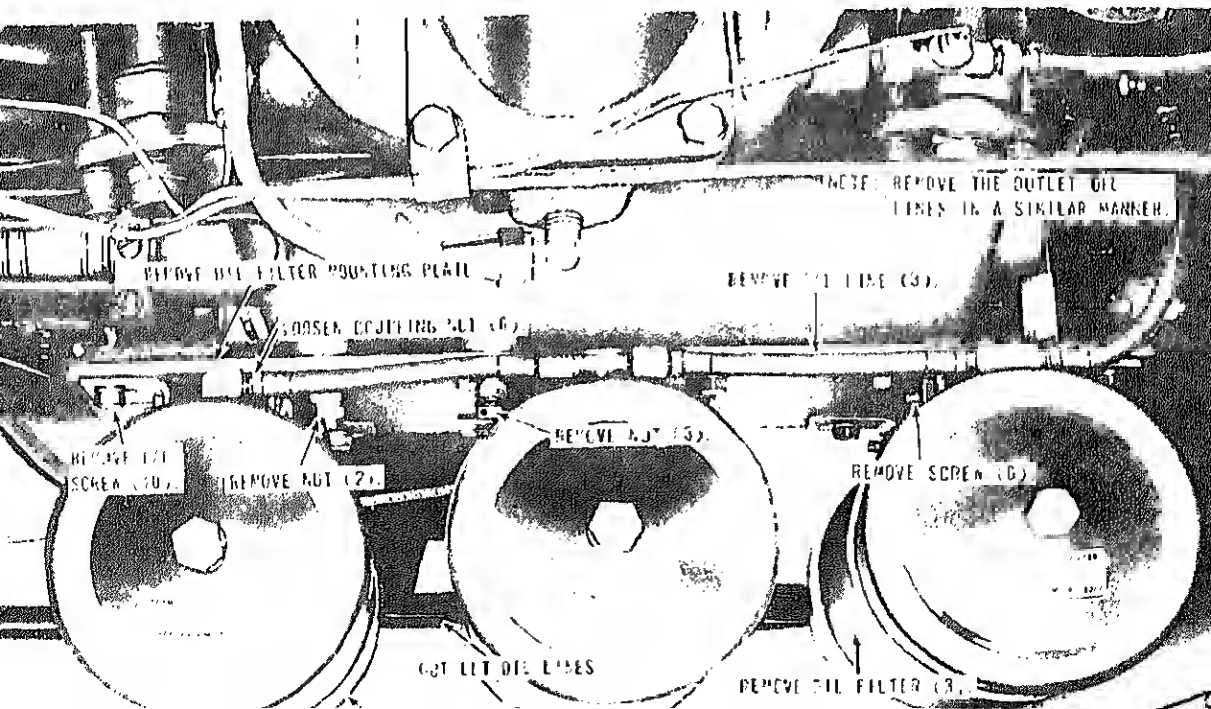
c. Installation. Install the oil filters and mounting bracket in reverse of instruction on figure 25.

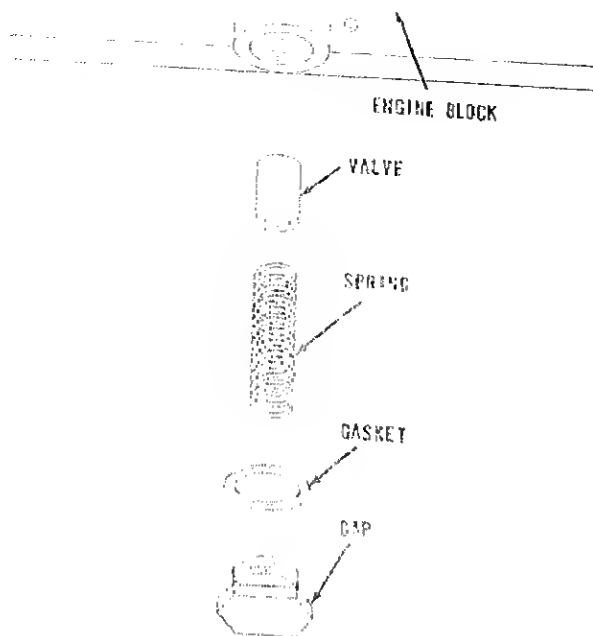
72. Oil Cooler Bypass Valve

a. Removal. Remove the oil cooler bypass valve as illustrated on figure 26.

b. Cleaning and Inspection. Clean and inspect all parts. Replace all worn or damaged parts as necessary.

c. Installation. Install the oil cooler bypass valve illustrated on figure 26.





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Figure 27. Oil cooler bypass valve, removal and installation.

(1) Remove the oil filters and bracket (par. 71).

(2) Remove the oil cooler as in figure 27.

b. *Cleaning and Inspection.* Clean the oil cooler. Replace if necessary.

c. *Installation.*

(1) Install the oil cooler in reverse of instructions on figure 27.

(2) Install the mounting bracket and filters (par. 71).

74. Crankcase Breather

a. *Removal.* Remove the crankcase breather as instructed on figure 27.

b. *Cleaning and Inspection.* Clean the crankcase breather. Replace if necessary.

c. *Installation.* Install the crankcase breather in reverse of instructions on figure 27.

75. Oil Lines and Fittings

a. *Removal.* Remove the oil lines and fittings (pars. 71 and 74).

b. *Cleaning and Inspection.* Clean the oil lines and fittings. Replace if necessary.

c. *Installation.* Install the oil lines and fittings (pars. 71 and 74).

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The engine exhaust system consists of two air-cooled manifolds mounted on the left side of the cylinder head below the water manifold. The exhaust pipe extends through the hood of the engine which provides for the mounting of the muffler. Water is prevented from entering the exhaust system and cylinder head by a water trap, secured to the top of the muffler.

77. Muffler Assembly

Removal. Remove the muffler in reverse order of assembly, see figure 7.

Cleaning and Inspection. Clean and inspect the muffler and clamps. Replace a defective muffler and mounting clamps.

Installation. Install the muffler as instructed in figure 7.

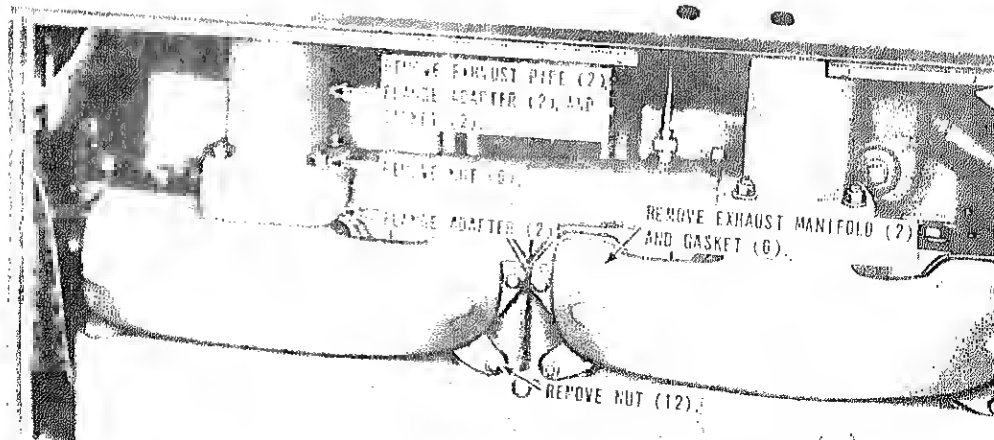
a. Removal.

- (1) Remove the muffler as instructed in figure 77).
- (2) Remove the engine housing and ports (par. 97).
- (3) Remove the exhaust pipe and manifolds as instructed on figure 78).

b. Cleaning and Inspection. Clean and inspect the exhaust pipes and manifolds. Replace damaged parts.

c. Installation.

- (1) Install the exhaust pipe and manifolds in reverse of instructions in figure 78).
- (2) Install the engine housing and ports (par. 97).
- (3) Install the muffler assembly as instructed in figure 77).



The electrical system of the jaw crusher is a 24-volt system which consists of four batteries, generator, generator regulator, starter, pressure gage and sending unit, water temperature gage and sending unit, battery indicator gage, overspeed governor, safety ignition switch, and the necessary wiring and connections to complete the system. Figure 1 is a wiring diagram for the jaw crusher electrical system.

Batteries and Cables

c. Testing.

- (1) Use a hydrometer to test each battery cell; each cell should read 1.280 specific gravity at 80°F. Recharge if the reading is 1.250 or less.
- (2) Use a voltmeter to test each cell for voltage. Each full charged cell must deliver 2 volts. A low voltage indicates a low charge or a defective cell. Recharge the battery if the output voltage varies more than 30 percent between cells, replace the battery.

Warning: Do not smoke or allow an open flame near charging batteries. Serious injury from explosion and acid could result. Avoid spilling electrolyte on clothing or flesh. Acid causes severe burns.

d. Removal.

- (1) Loosen locknut (fig. 6) and place clamp handle up or at right angle to battery terminal.
- (2) Remove cables from battery terminals; inspect clamps for loose or corroded condition. Remove corrosion and coat battery terminals and clamps with grease.

e. Cleaning and Inspection. Clean and inspect the batteries. Replace as necessary.

a. Removal.

- (1) Remove the batteries and cables (page 80).
- (2) Remove the battery box as instructed on figure 29.

b. Disassembly. Disassemble the battery box as illustrated on figure 30.

c. Cleaning, Inspection, and Repair. Clean and inspect the battery cables and box. Repair or replace all damaged parts.

d. Reassembly. Reassemble the battery box as illustrated on figure 30.

e. Installation.

- (1) Install the battery box in reverse of instructions on figure 29.
- (2) Install the batteries and cables (page 80).

82. Battery Charging Receptacle

a. Removal. Remove the battery charging receptacle as instructed on figure 31.

b. Cleaning and Inspection. Clean and inspect the battery charging receptacle for damage or defects. Replace a defective receptacle if necessary.

c. Installation. Install the battery charging receptacle in reverse of instructions on figure 31.

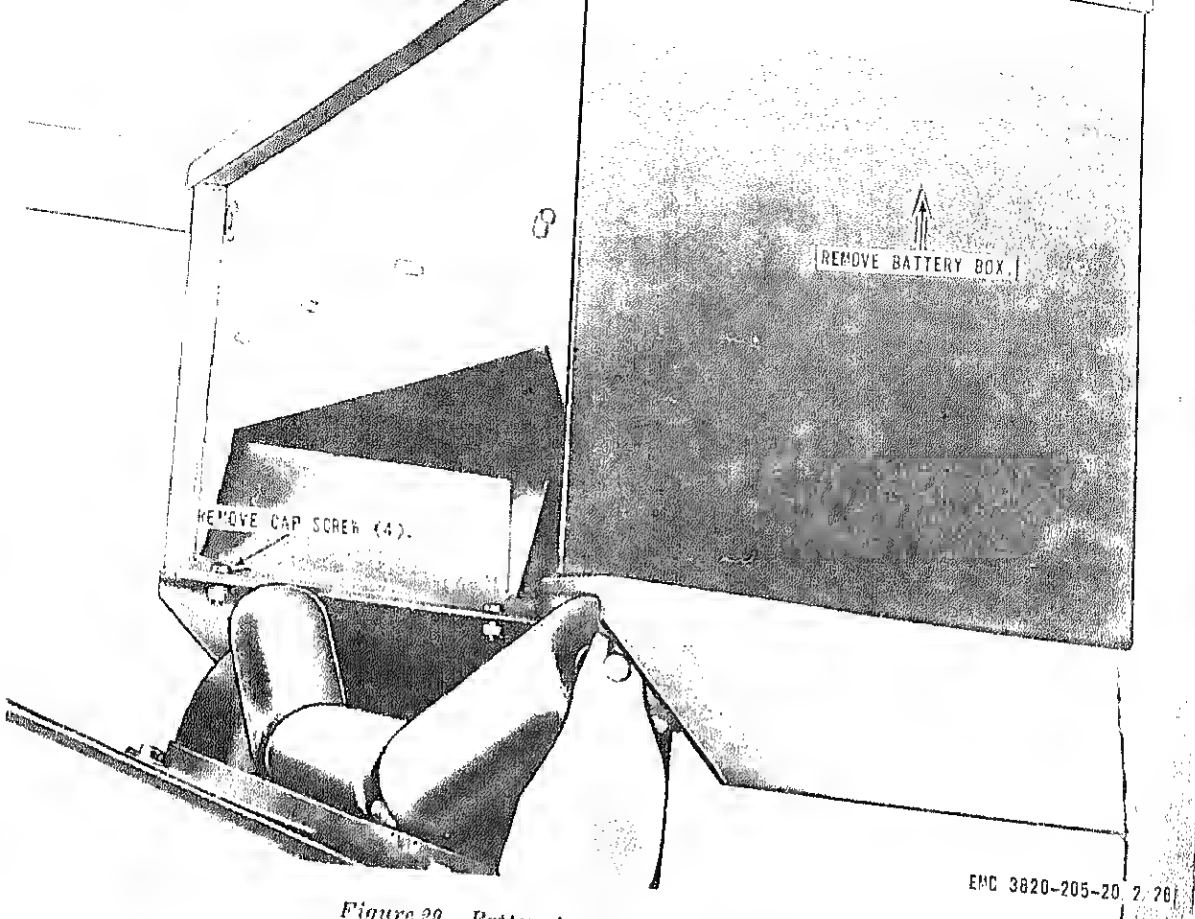
83. Generator Regulator

a. Removal. Remove the generator regulator from the jaw crusher as instructed on figure 32.

b. Cleaning, Inspection, and Repair. Clean and inspect. Replace a worn, damaged, or defective generator regulator.

c. Installation. Install the generator regulator in reverse of the instructions on figure 32.

Caution: The engine generator must be properly



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Figure 29. Battery box, removal and installation.

ibration, heavy arcing, and burning. Polarize the generator by disconnecting the field lead at the regulator and momentarily connecting a jumper lead between the generator field terminal and the regulator battery terminal. Remove the jumper lead and connect field lead to the generator (3, fig. 33).

d. Test and Adjustment.

(1) Mechanical adjustment.

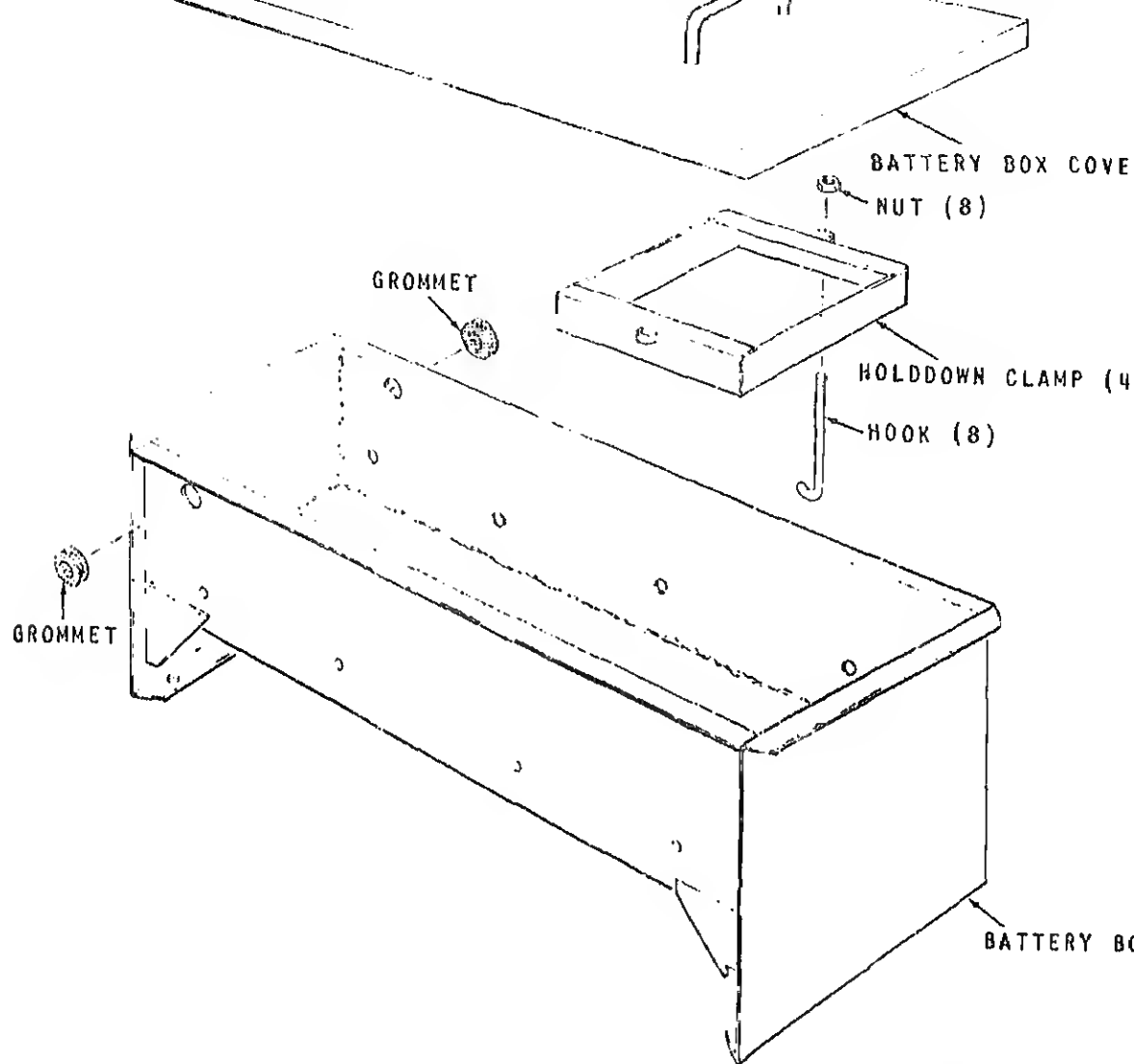
- (a) Disconnect regulator-to-battery cable.
- (b) Remove regulator cover as instructed on figure 32.
- (c) Press down on the cutout relay

correct air gap for the cutout relay is 0.048 inch.

Note. Do not measure the cutout relay air gap between the brass residual pin in the coil and the armature.

- (d) Should the cutout relay air gap not be as specified, bend the armature stop up or down to obtain the proper clearance.

Caution: Make certain the cutout relay contact bracket is in proper position to allow both contact points to close simultaneously.



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Figure 30. Battery box, exploded view.

screws securing the cutout relay contact bracket to the cutout relay and raise or lower the cutout relay contact bracket until the specified air gap is obtained. Secure the ad-

(g) Push down on the voltage regulator armature (2, fig. 33) until the voltage regulator contact point bar touches the air gap adjusting screw. Measure the air gap between

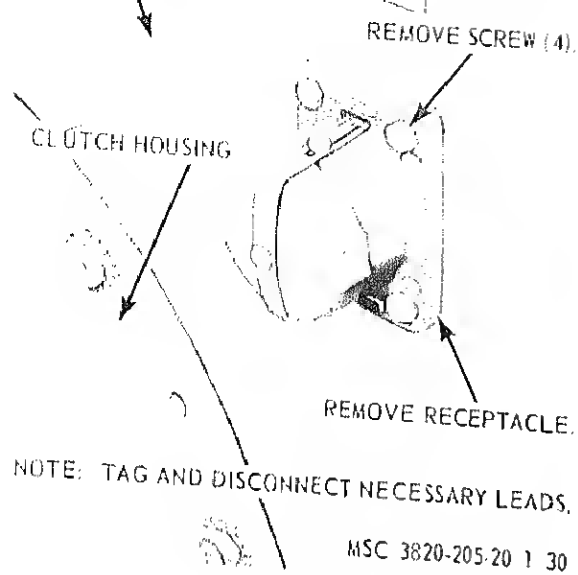
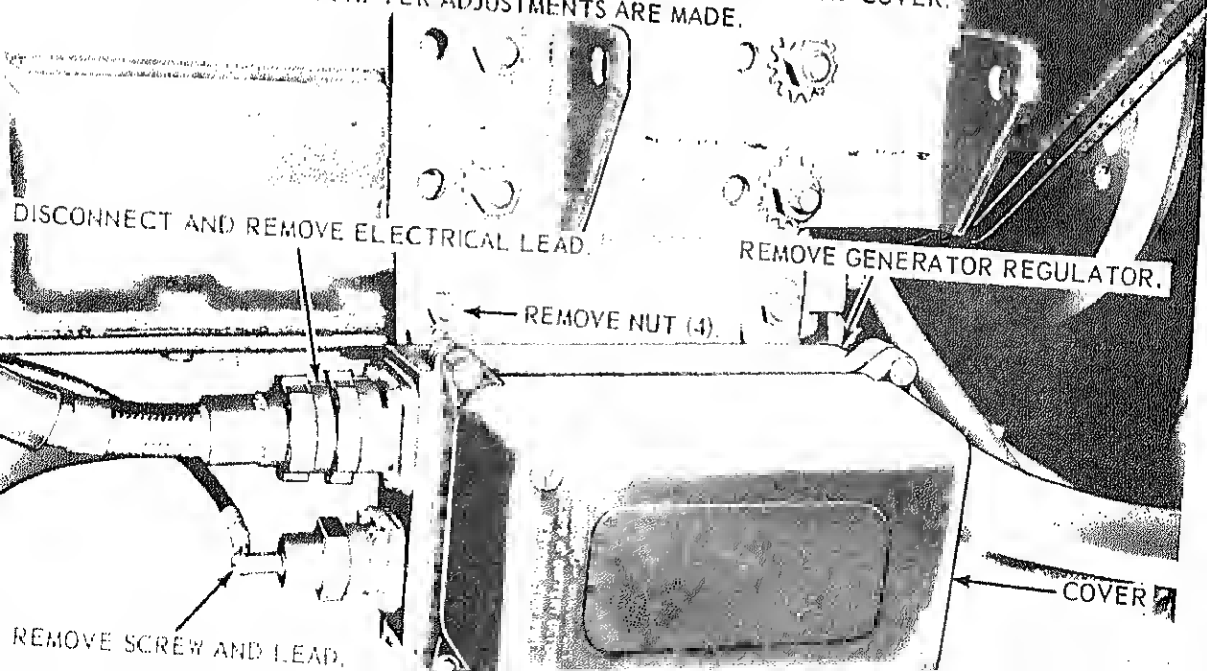


Figure 31. Battery charging receptacle, removal and installation.

NOTE: IF REGULATOR IS TO BE ADJUSTED REMOVE SCREW (4) AND COVER.
REPLACE COVER AFTER ADJUSTMENTS ARE MADE.



Adjusting screw to obtain correct voltage regulator air gap 0.084 inch.

- (h) Adjust the current regulator air gap to 0.115 inch in the same manner as the voltage regulator unit was adjusted, described in (g) above.
- (2) *Electrical adjustments.* Install set test adapters.

Note. Refer to 3, figure 33 and polarize the generator.

- (a) *Cutout relay closing voltage.* With voltmeter connected as shown on figure 33, start the engine and slowly increase speed until the cutout relay contact points close. Observe voltage reading at which this occurs. It should be between 28 and 32 volts. If adjustment is necessary, turn cutout relay adjusting screw clockwise to increase or

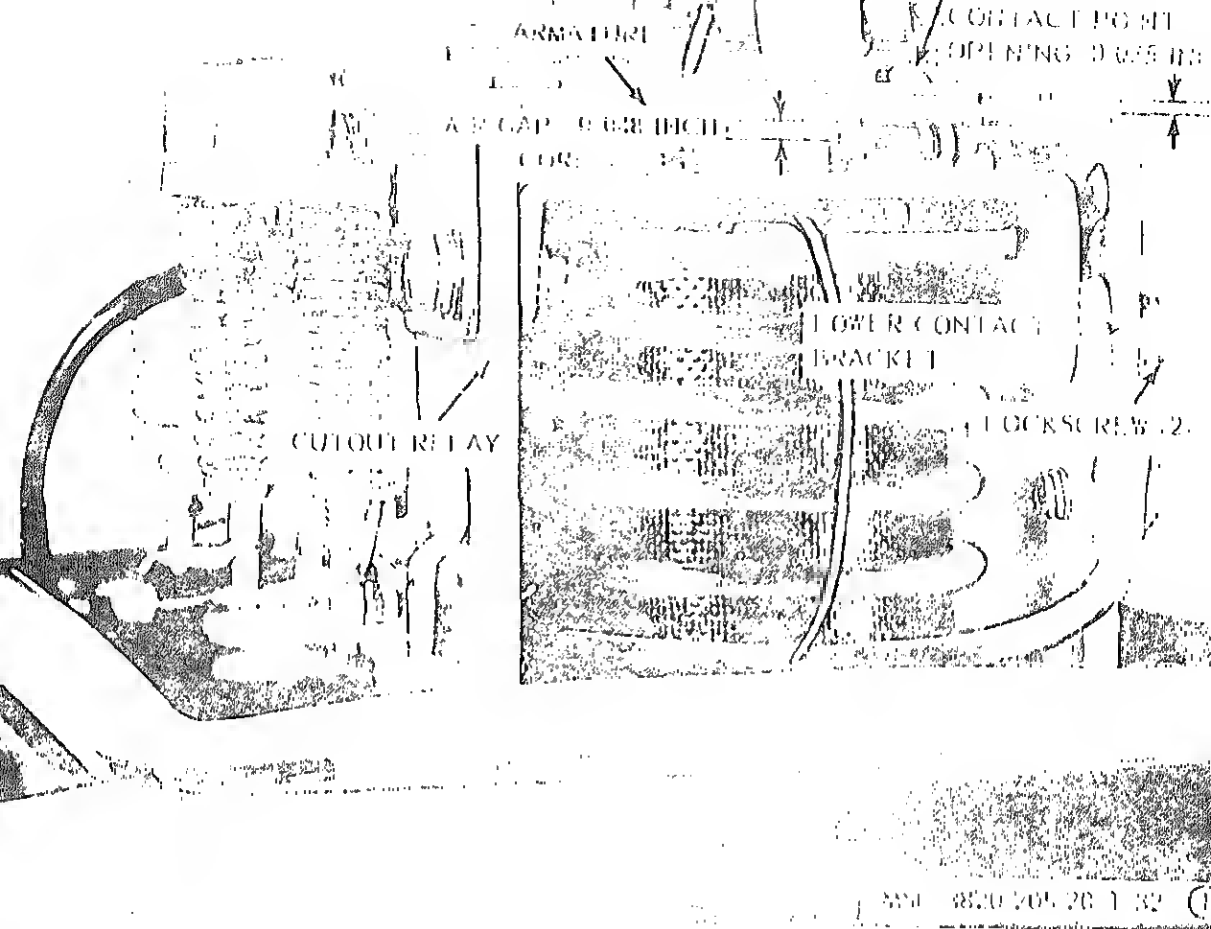
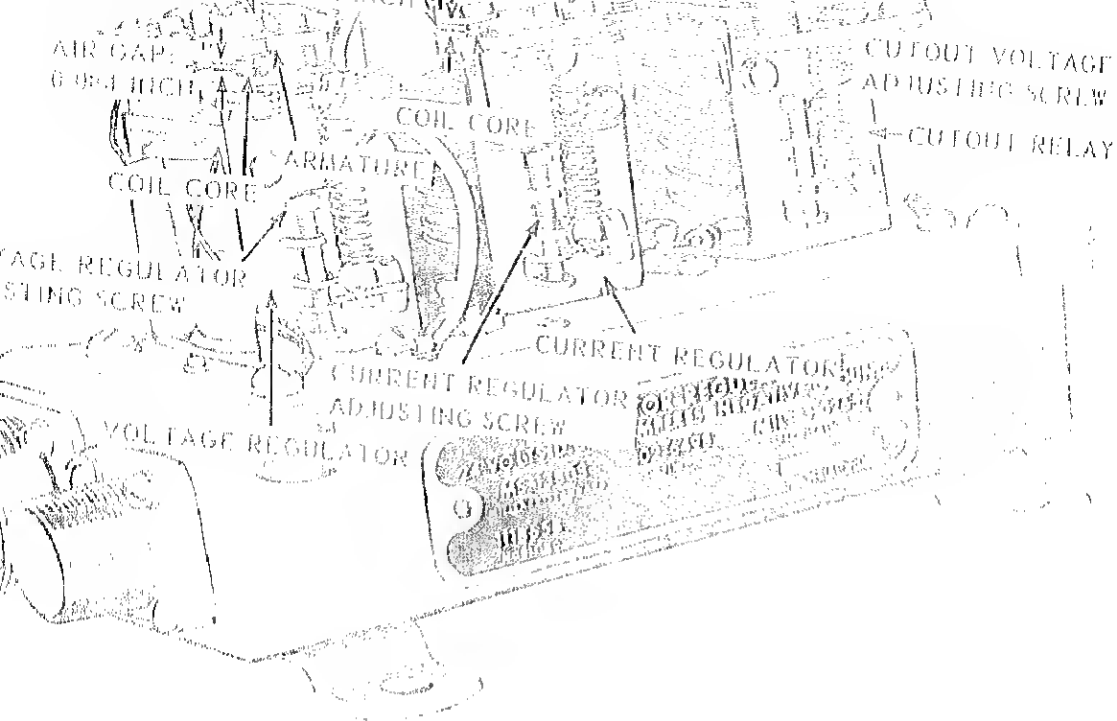


Figure 33. Generator regulator adjustment and test wiring diagram.

counterclockwise to decrease the closing voltage. Set closing voltage at 26 volts.

- (b) *Voltage regulator opening voltage.* With voltmeter connected as shown on 5, figure 33, increase rpm to operating speed. Observe reading on voltmeter. It should read between 27.5 and 29.5 volts. If adjustment is necessary, turn the voltage regulator adjusting screw clock-

shown on 6, figure 33 and with the test set carbon pile load set at 25 to 30 amps or, first having operated the starter for 10 to 20 seconds to provide the load, increase rpm to operating speed, observe reading on ammeter at which points first vibrate. This should be between 38 and 42 amperes. If adjustment is necessary, adjust the current regulator to 40 amperes



MSC 3820-205-20 1 32 (2)

Figure 33—Continued.

and amperage output through several cycles of increasing and decreasing engine speed from idle-to-operating-to-idle speed to make sure adjustments are stable.

Remove adapters and connect cables.

Install regulator cover.

Generator and Bracket

Test.

Make a test connection as shown on figure 33.

Start engine and slowly build up rpm to operating speed. Observe voltage. The minimum voltage

(3) If voltage is not built up to required value, generator is defective and must be replaced.

b. Removal. Remove the generator and mounting bracket from the engine as instructed on figure 3-1.

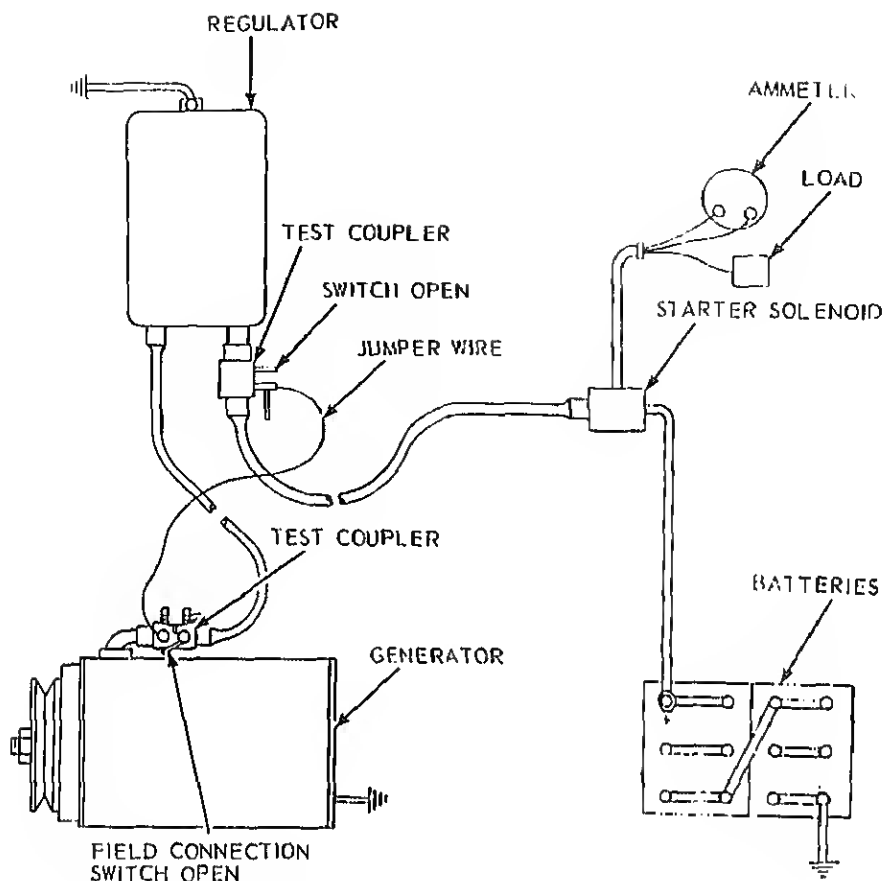
Note. If removing bracket, remove the generator (par. 82).

c. Cleaning, Inspection, and Repair.

(1) Clean the generator with a cloth dampened with approved cleaning solvent.

(2) Inspect the generator for loose assembly hardware.

(3) Replace



NOTE: MOMENTARILY CONNECT THE JUMPER WIRE AS ILLUSTRATED TO POLARIZE THE GENERATOR.

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③

Figure 33—Continued.

or the field pole shoes. Replace a defective generator.

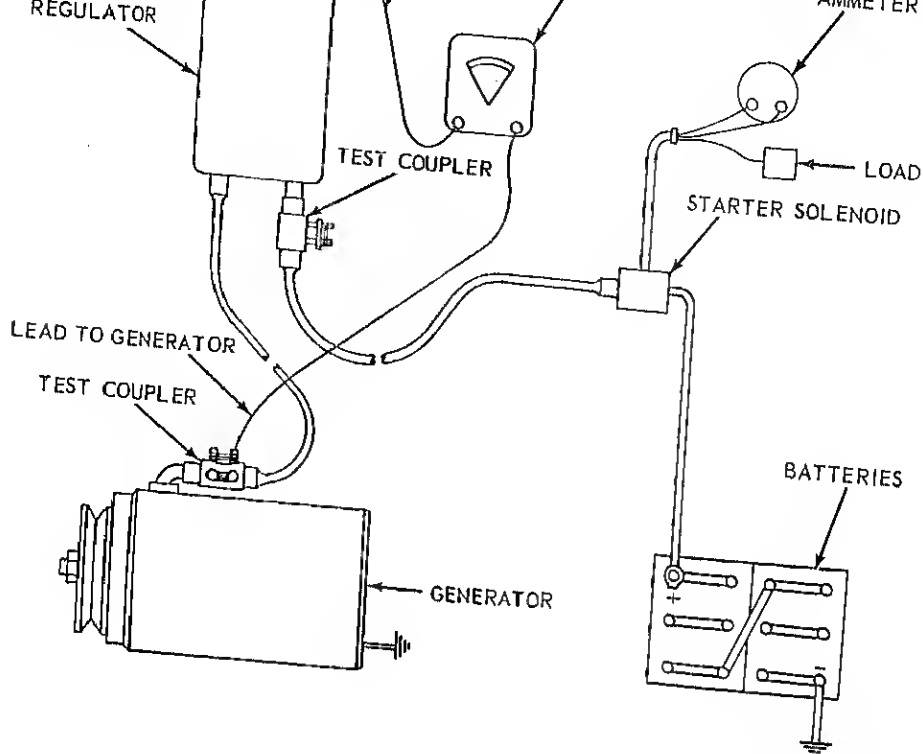
- (4) Inspect and replace brushes as instructed in *d* below.

d. Brush Replacement.

- (3) Install new brushes on the generator in reverse of instructions on figure 32.

c. Installation.

- (1) Install the generator and mounting bracket on the engine in reverse



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③

Figure 37—Continued.

- (2) If the starter operates, the solenoid is defective. Replace a defective solenoid.
- b. *Removal.* Remove the starter solenoid from the starter as instructed on figure 36.
- c. *Cleaning, Inspection, and Repair.* Clean and inspect. Replace a defective solenoid.
- d. *Installation.* Install the starter solenoid on the starter in reverse of the instructions on figure 36.

6. Starter

a. On-equipment Test.

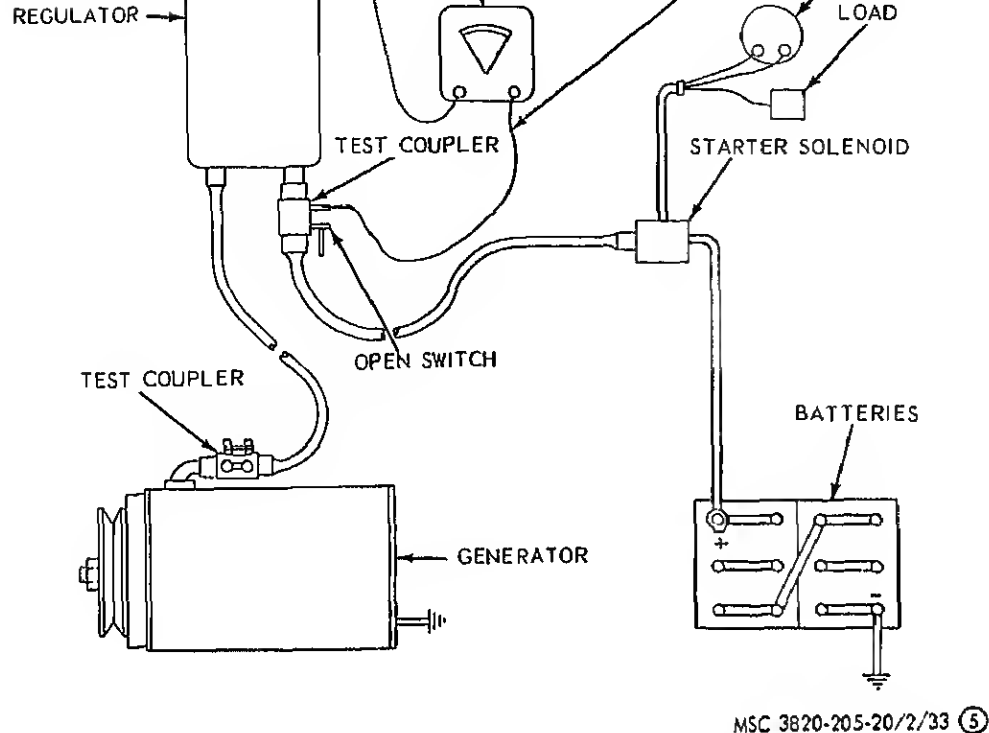
- (1) Connect a heavy jumper lead across the large terminals on the starter solenoid.
- (2) If the starter

c. Cleaning, Inspection, and Repair.

- (1) Clean the starter with a cloth dampened with an approved cleaning solvent.
- (2) Replace a damaged or defective starter as necessary.

d. Brush replacement.

- (1) Remove the cover band from the starter as instructed on figure 36.
- (2) Remove the brushes from the starter as instructed on figure 37.
- (3) Inspect the brushes for worn, or chipped condition. Replace brushes if worn to less than one-half inch in length.



(5)

Figure 33—Continued.

- (5) Install the cover band on the starter in reverse of the instructions on figure 36.

Installation. Install the starter on the line in reverse of the instructions on figure

- (2) Install the oil pressure gage in reverse of instructions on figure 38.

88. Water Temperature Gage and Sending Unit

a. Removal.

- (1) Remove the water temperature gage as instructed on figure 38.
- (2) Remove the water temperature gage sending unit as instructed on figure 40.

b. Cleaning and Inspection. Clean and inspect the water temperature gage and sending unit for damage. Replace as required.

c. Installation.

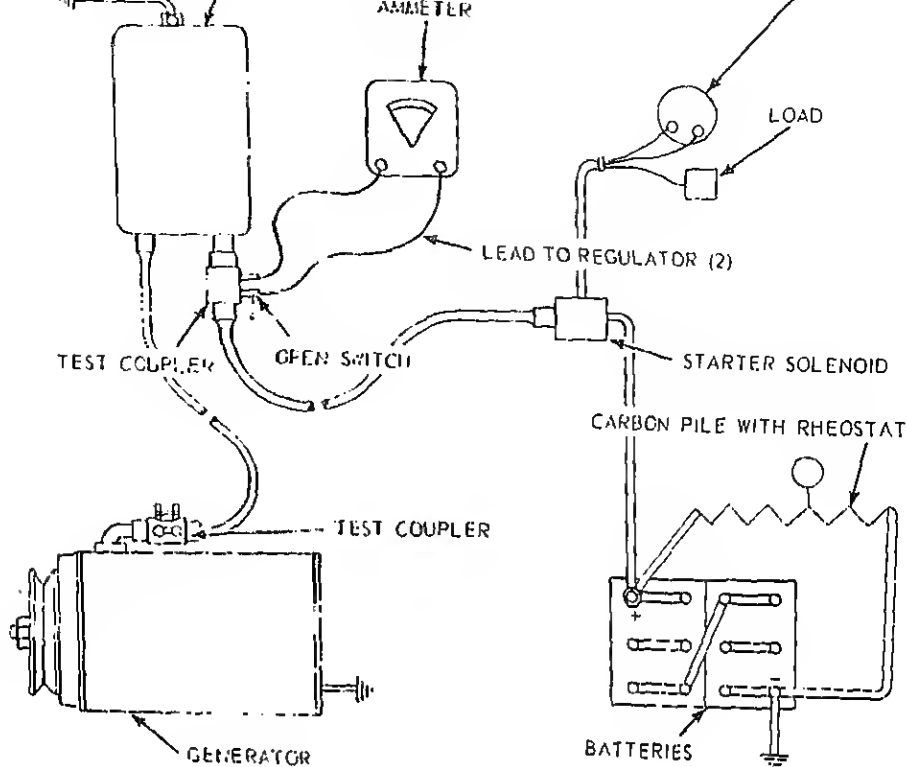
- (1) Install the water temperature gage

Oil Pressure Gage and Sending Unit

a. Removal.

- (1) Remove the oil pressure gage as instructed on figure 38.
- (2) Remove the oil pressure gage sending unit as instructed on figure 39.

b. Cleaning and Inspection. Clean and inspect the oil pressure gage and sending unit for damage. Replace as necessary.



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Figure 14--Continued.

89. Battery Generator Indicator

a. Removal. Remove the battery generator indicator as instructed on figure 38.

b. Cleaning and Inspection. Clean and inspect the battery indicator gage for damage. Replace as necessary.

c. Installation. Install the battery generator indicator in reverse of instructions on figure 38.

90. Overspeed Governor

a. Removal. Remove the overspeed governor as instructed on figure 41.

b. Cleaning and Inspection. Clean and inspect the

91. Safety Switch and Water Temperature Sending Unit

a. Removal. Remove the water temperature sending unit and safety switch as instructed on figure 42.

b. Cleaning and Inspection. Clean and inspect the safety switch and water temperature sending unit for damage. Replace as necessary.

c. Installation. Install the water temperature sending unit and safety switch in reverse of instructions on figure 42.

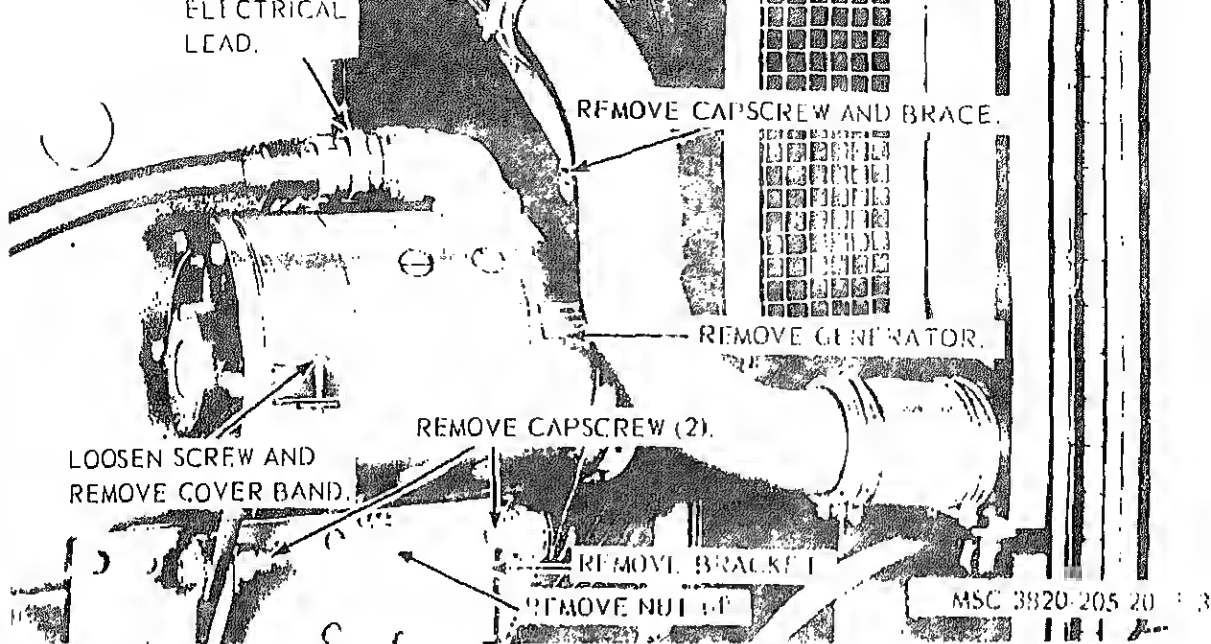
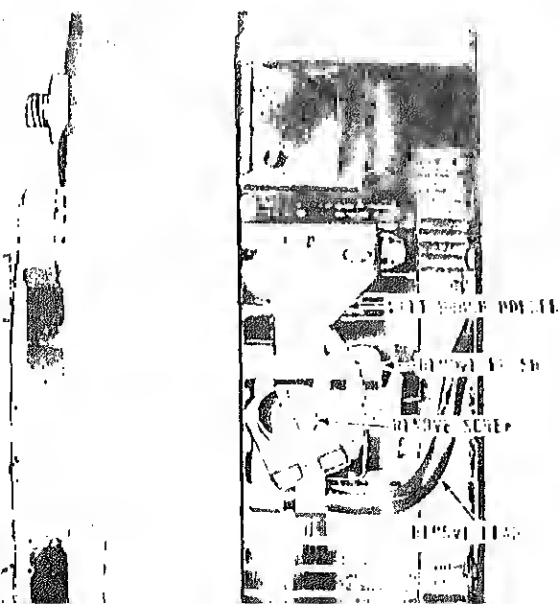


Figure 34. Generator and mounting bracket, removal and installation.



b. *Cleaning and Inspection.* Clean and inspect the starter switch for defects. Replace as required.

c. *Installation.* Install the starter switch in reverse of instructions on figure 38.

93. Engine Wiring and Warning Lights

a. *Wiring.*

- (1) *Removal.* Remove the engine wiring as instructed on figures 38 and 42.
- (2) *Cleaning, inspection, and replacement.* Clean and inspect the engine wiring. Repair or replace as necessary.
- (3) *Installation.* Install the engine wiring in reverse of instructions on figures 38 and 42.

b. *Warning Lights.*

- (1) *Removal.* Remove the warning light assembly as instructed on C, figure 38.

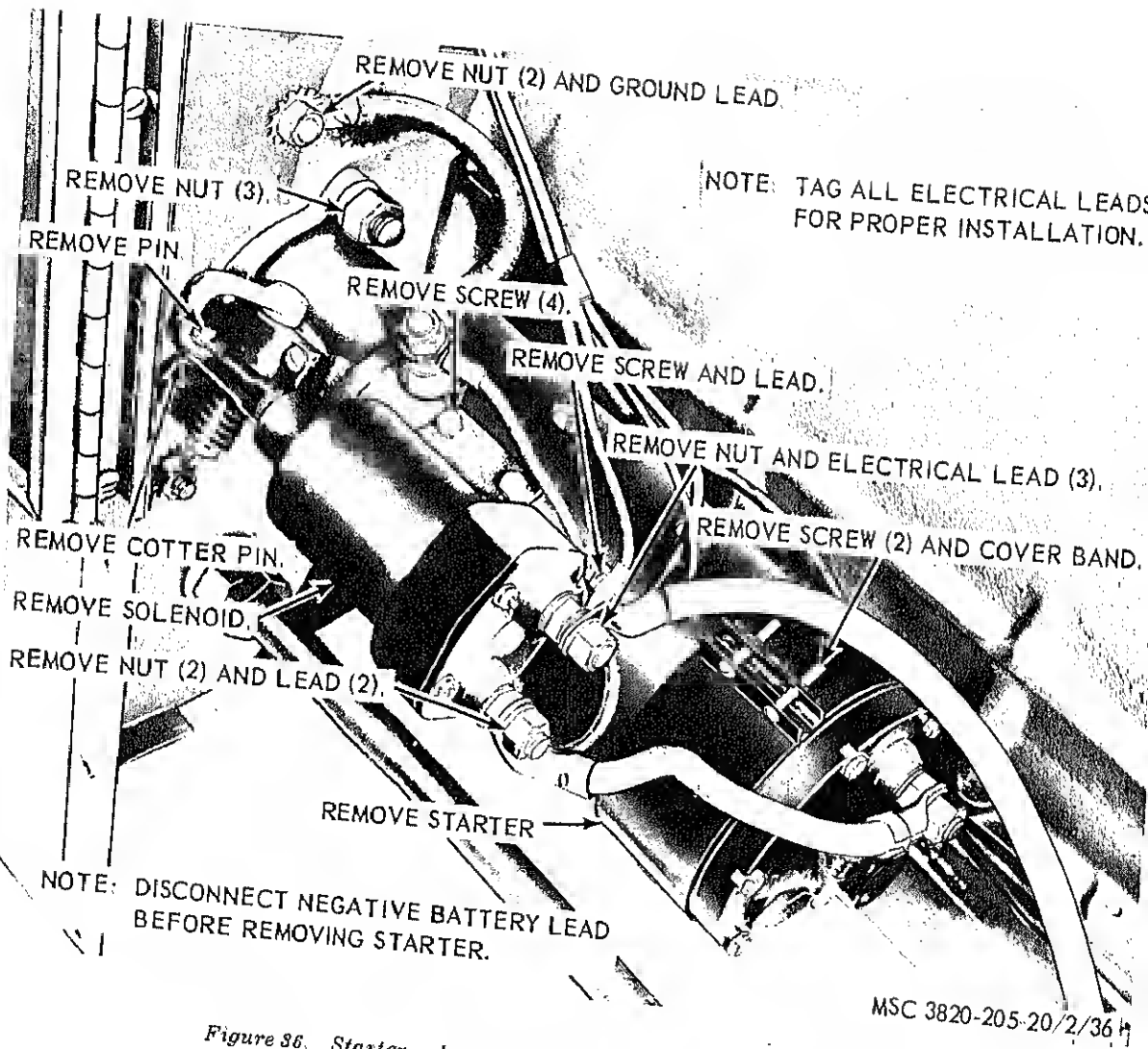


Figure 36. Starter, solenoid, and cover band, removal and installation.

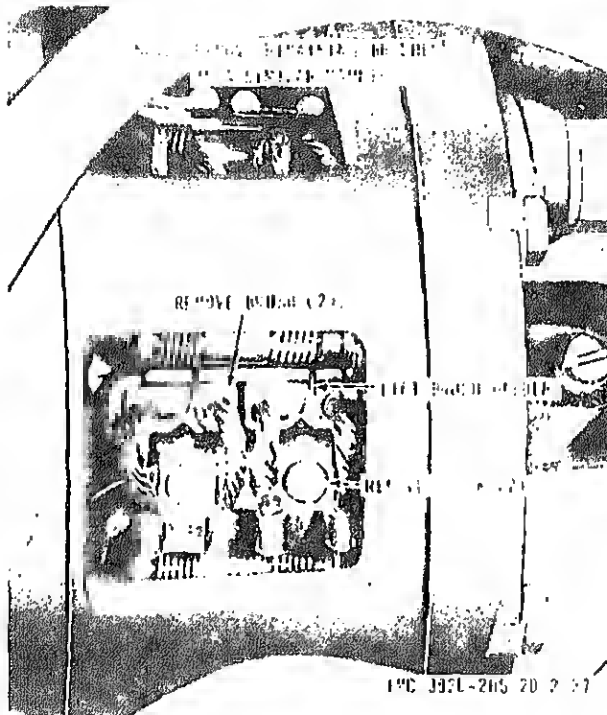


Figure 37. Starter brush replacement.

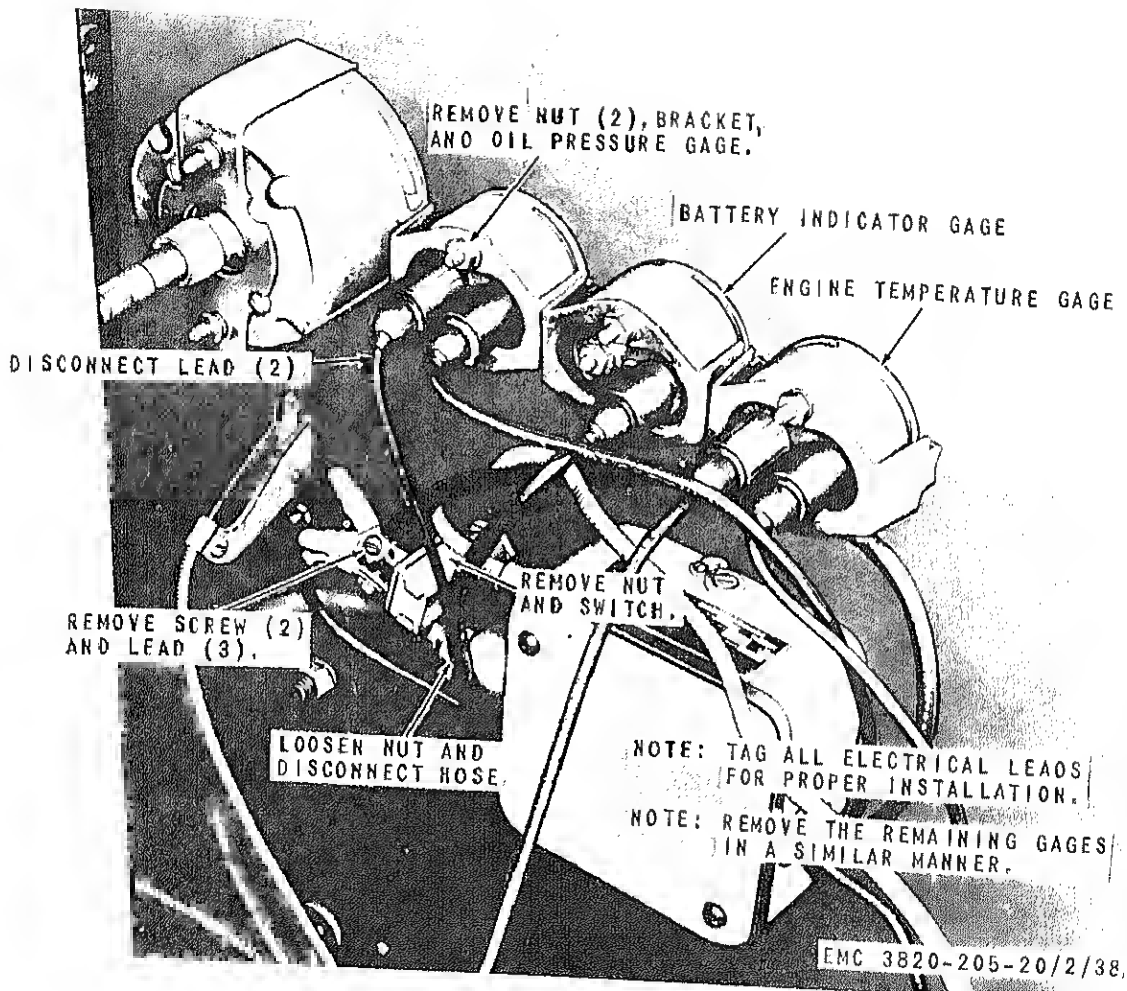
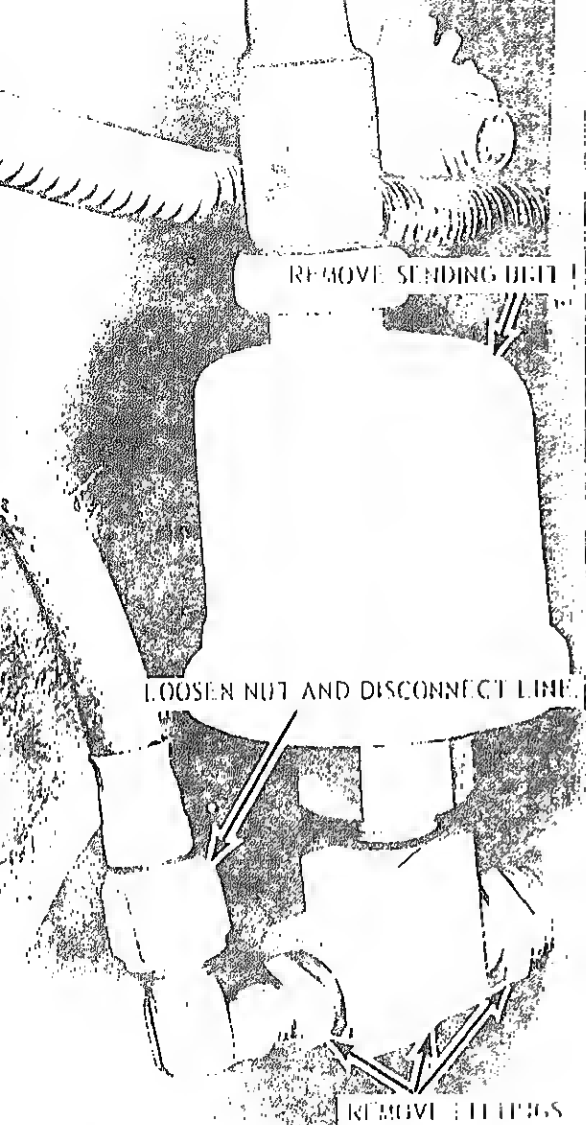


Figure 38. Gages and switch, removal and installation.



NOTE: ON UNITS WITH THE SERIAL NUMBER RANGE 2020 THROUGH 2172 THE WARNING LIGHT SENDING UNIT IS INSTALLED IN PLACE OF THE LINE.

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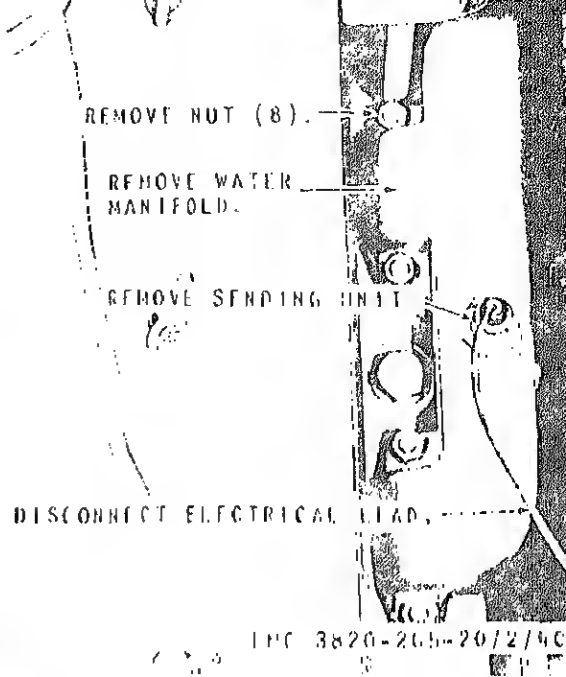
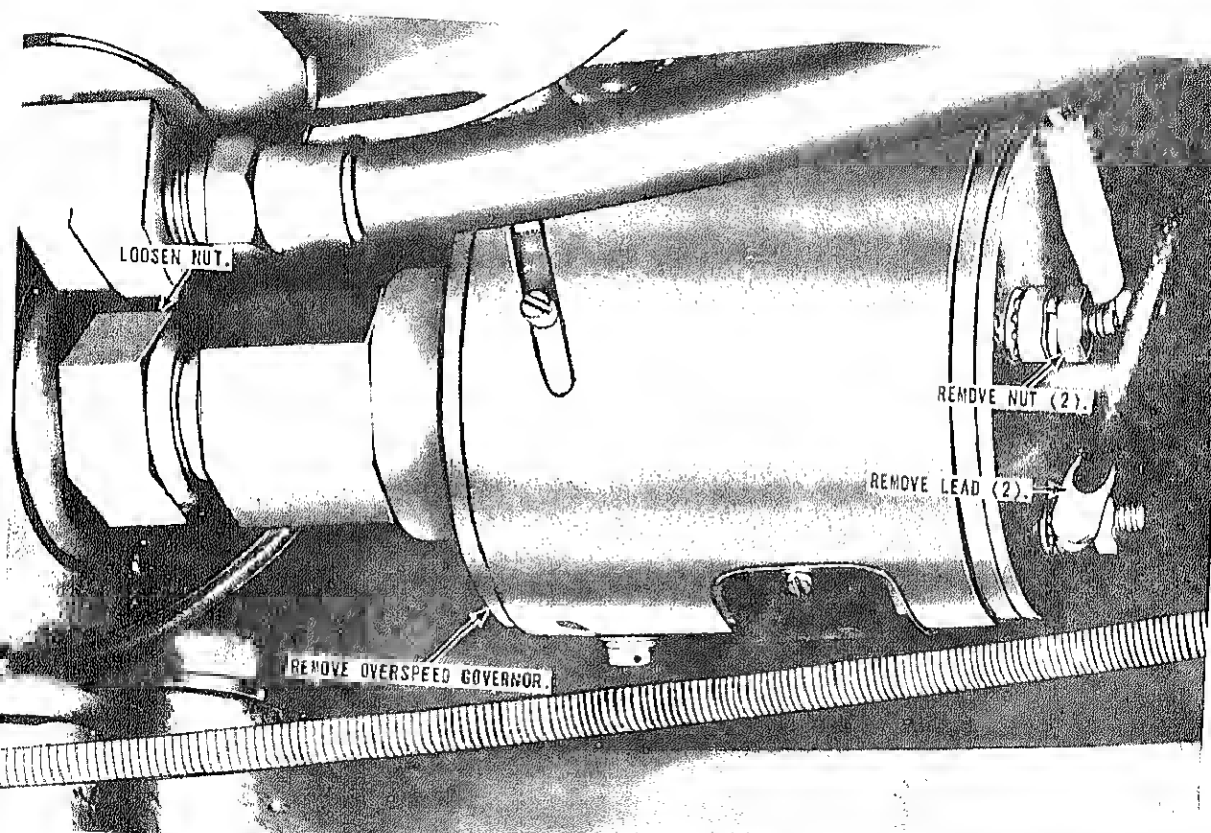


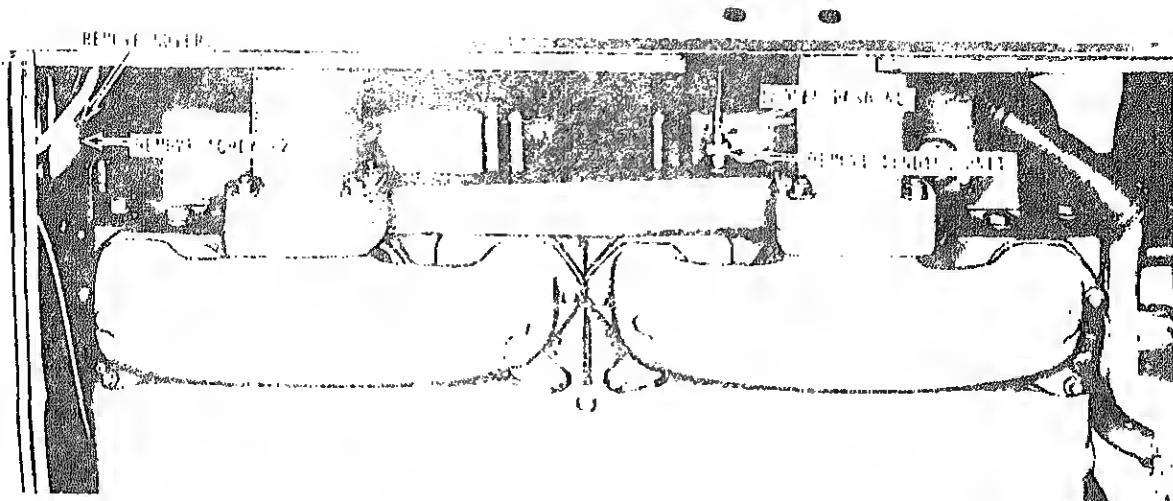
Figure 40. Water temperature gage sending unit manifold, removal and installation.

Figure 39. Oil pressure gage sending unit, removal and installation.

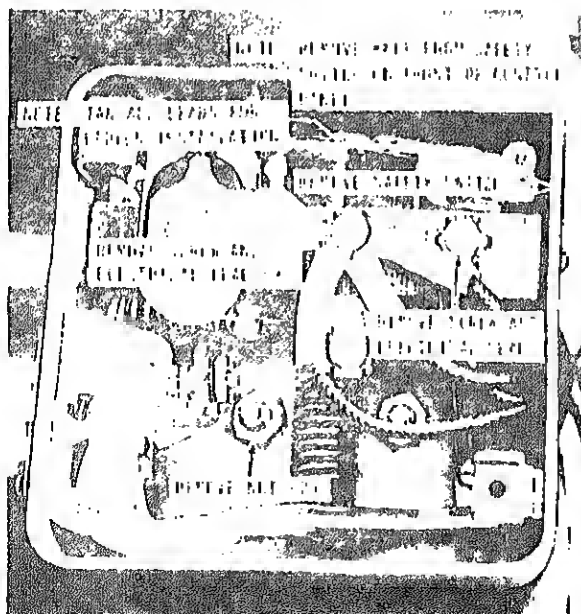


ENC 3820-205-20 2 41

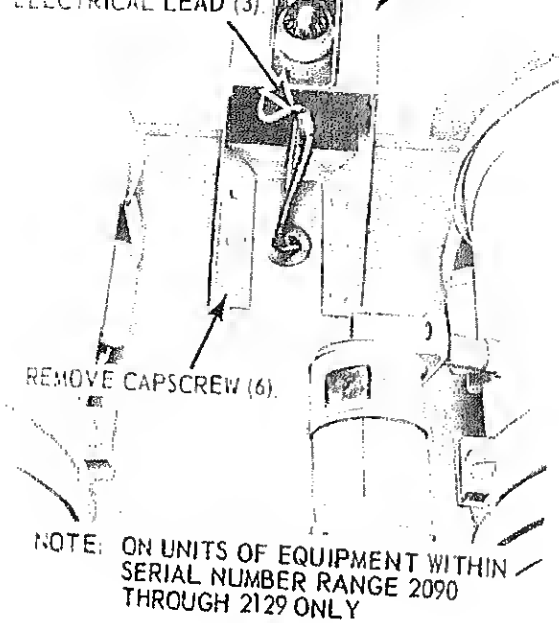
Figure 41. Overspeed governor, removal and installation.



A



B



C
MSC 3820-205-20/1.41 (2)

Remove and high water temperature warning lights (on units of equipment within serial No. range 2090 through 2129 only)

Figure 42—Continued.

Section VI. ENGINE HOUSING

Remove:

Engine housing is constructed of precast concrete and includes the doors, door supports, side panels, hood, radiator cowling, and all necessary attaching hardware.

Water Drain Lines

1. Remove the drain lines as instructed on figure 43.
2. Clean and inspect the drain lines. Clean and inspect the drain lines as necessary.
3. Install the drain lines in reverse order of removal on figure 43.

Remove:

b. Cleaning, Inspection, and Repair. Clean and inspect the doors for any damage. Repair or replace if necessary.

c. Installation. Install the doors in reverse of instructions on figure 44.

97. Engine Door Supports and Side Panels

a. Removal.

(1) Remove the crankcase and water drain lines (par. 95).

(2) Remove the doors (par. 96).

(3) Remove the engine door supports and side panels as instructed on figure 45.

b. Cleaning

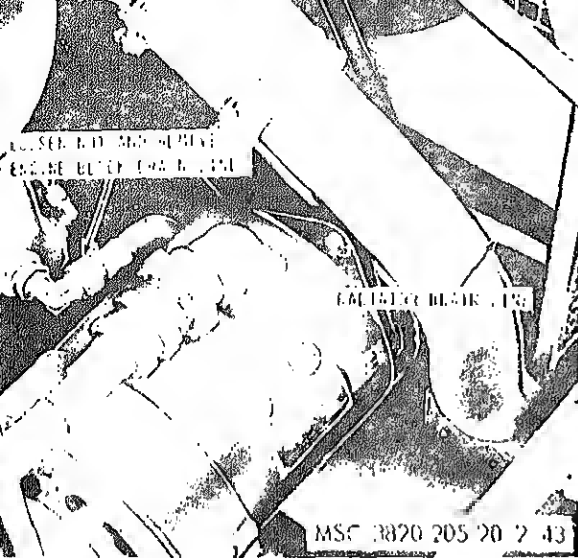


Figure 43. Drain lines, removal and installation.

c. Installation.

- (1) Install the engine side panels and door supports in reverse of instructions on figure 45.
- (2) Install the crankcase and water drain lines (par. 95).
- (3) Install the engine doors (par. 96).

8. Hood, Radiator Cowling, and Rear Panel

a. Hood, and Radiator Cowling Removal.

- (1) Remove the muffler (fig. 7).
- (2) Remove the door supports and side panels (par. 97).
- (3) Remove the hood and radiator cowling from the unit as instructed on figure 45.

- (3) Remove the safety ignition switch (par. 91).
- (4) Remove the tachometer-hourmeter (par. 57).
- (5) Remove the indicator gages and switches (pars. 87 through 89 and 92).
- (6) Remove the battery charging receptacle (par. 82).
- (7) Remove the rear panel from the unit as instructed on figure 45.

c. *Cleaning, Inspection, and Repair.* Clean and inspect. Replace or repair worn, damaged or defective parts as necessary.

d. Hood, and Radiator Cowling Installation.

- (1) Install the hood and radiator cowling on the unit in reverse of the instructions on figure 45.
- (2) Install the door supports and side panels (par. 97).
- (3) Install the muffler (fig. 7).

e. Rear Panel Installation.

- (1) Install the rear panel on the unit in reverse of the instructions on figure 45.
- (2) Install the indicator gages (pars. 87 through 89 and 92).
- (3) Install the tachometer-hourmeter (par. 57).
- (4) Install the safety ignition switch (par. 91).
- (5) Install the ether starting aids (par. 66).
- (6) Install the air cleaner (par. 63).

REMOVE COVER

REMOVE COVER (5)

NOTE: REMOVE THE REMAINING LUGS
IN A SIMILAR MANNER.

ENC 3820-205-2G 2 C

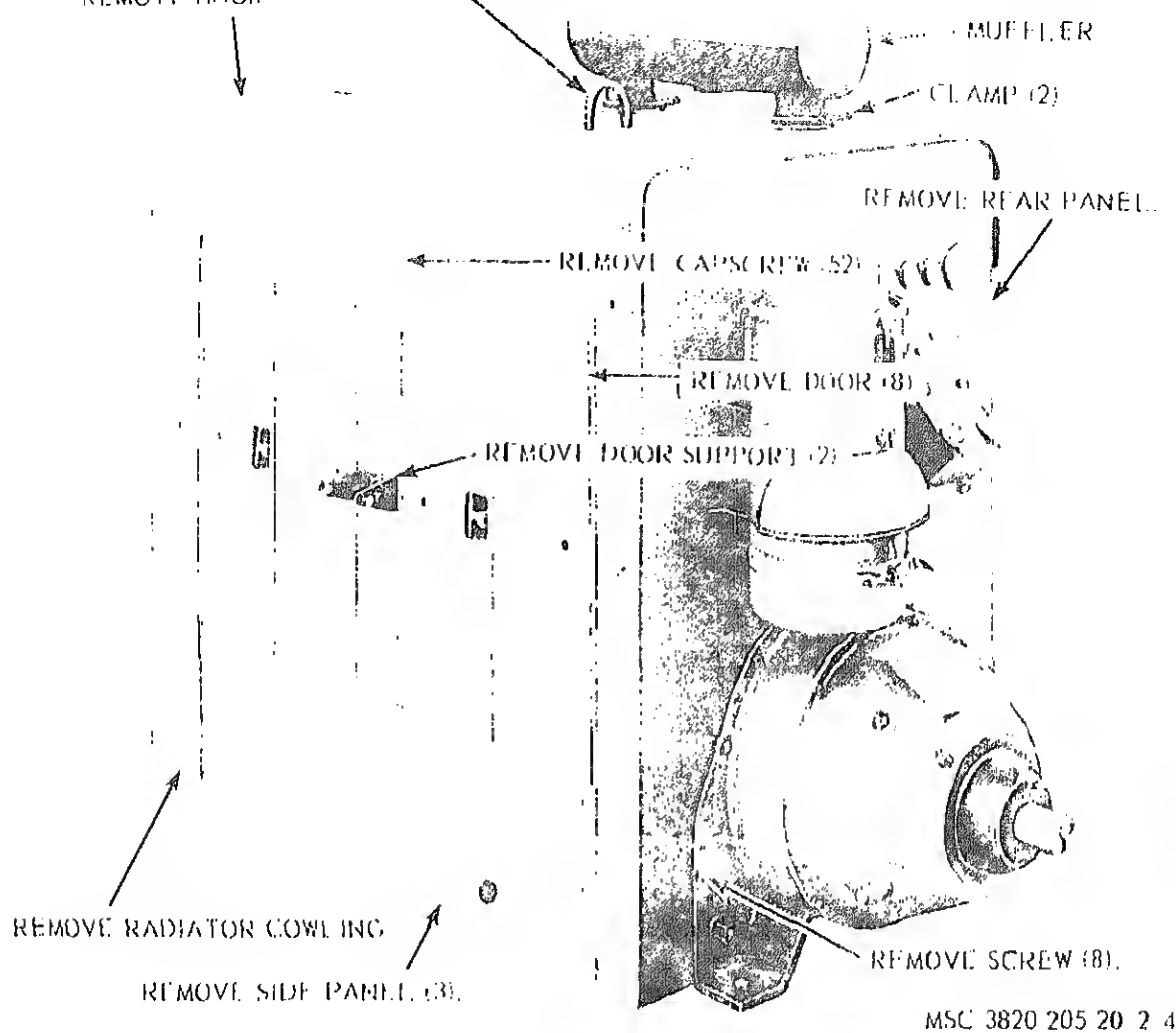


Figure 35. Engine housing, removal and installation.

Section VII. VALVE COVER AND ROCKER ARM ASSEMBLY

99. General

The engine intake and exhaust valves are located in the cylinder heads. There are three intake and three exhaust valves, rocker arms, and rocker arm adjusting screws located under each valve cover. The valve covers and breather

- (1) Remove the engine hood (par. 98).
 - (2) Remove the two valve covers and breather as instructed on figure 16.
- b. *Cleaning and Inspection.* Clean and inspect all parts. Replace gaskets and damaged parts.

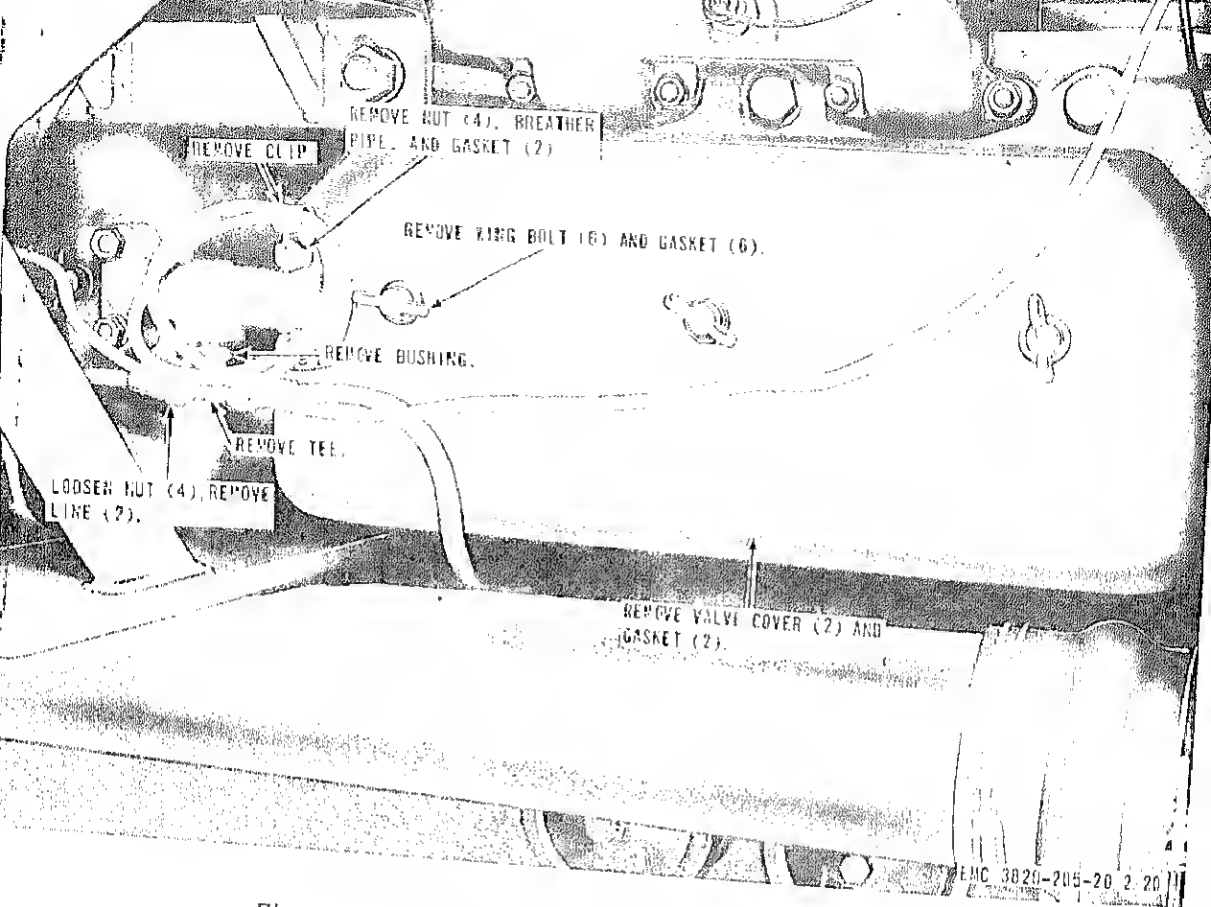


Figure 46. Valve covers and breather, removal and installation.

1. Rocker Arm Adjustment

a. *Removal.* Remove the valve covers and breather (par. 100).

b. *Adjustment.* Adjust each of the six in-

take and six exhaust valve rocker arms as instructed on figure 47.

c. *Installation.* Install the valve covers and breather (par. 100).

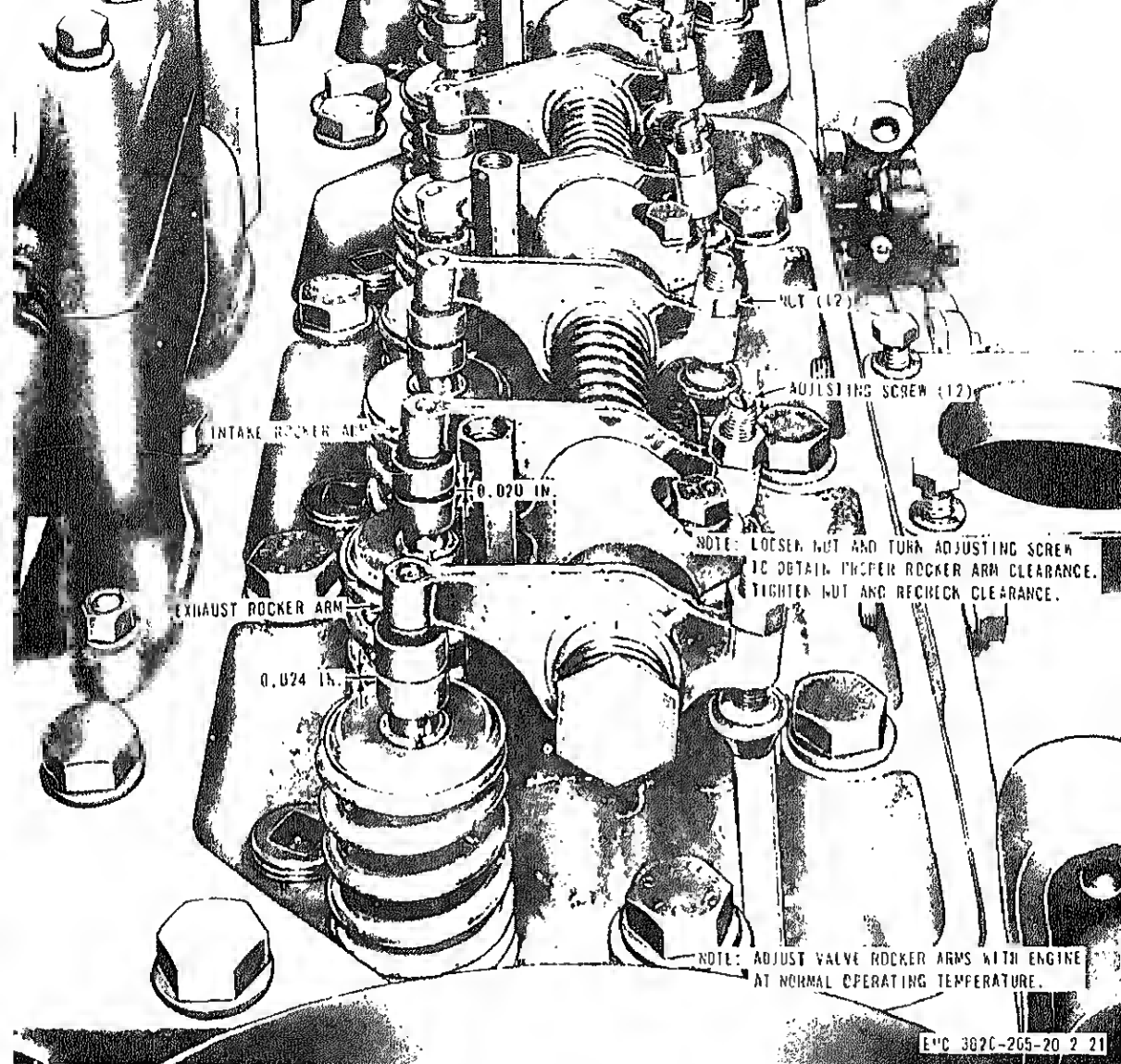


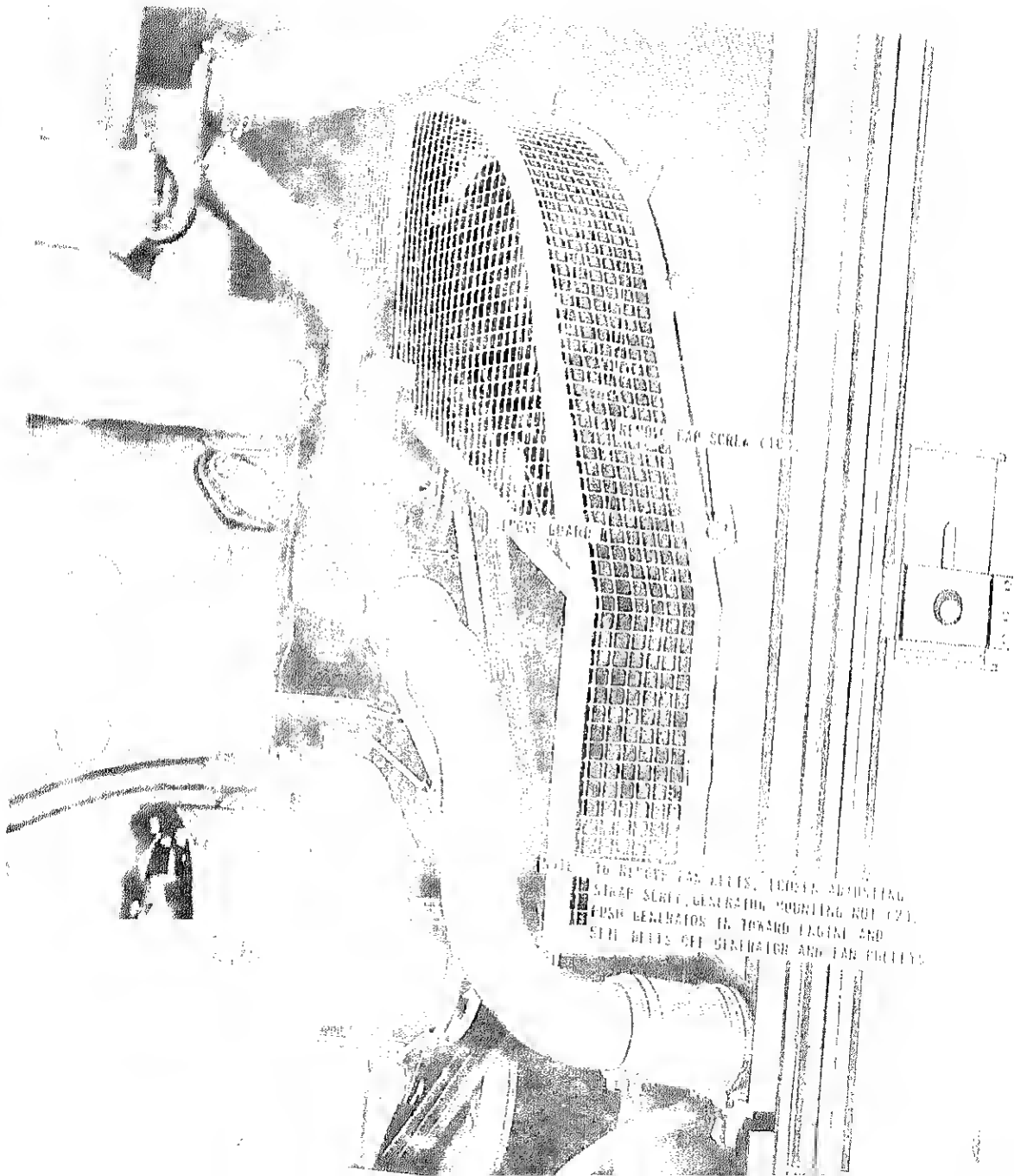
Figure 47. Rocker arm adjustment.

Section VIII. •ENGINE COOLING SYSTEM

02. General

The engine cooling system consists of a fan

temperature is controlled by the thermostat keep the engine at operating temperature. T



FOR SERIAL (10)

TO REPORT THE RESULTS, UNDER ADJUSTING
STRAIGHT, GENERATOR, MOUNTING RUI (21)
FOR GENERATOR IN, TOWARD ENGINE AND
SIDE, WITH THE GENERATOR AND FOR FUELING

b. *Cleaning and Inspection.* Clean and inspect the fan belt for fraying or any other damage. Replace as necessary.

c. *Installation.*

(1) Install the fan belts in reverse of instructions on figure 48.

(2) Install the fan guard (par. 103).

d. *Adjustment.* Adjust the fan belt (TM 5-3820-205-10/2).

05. Fan and Water Pump

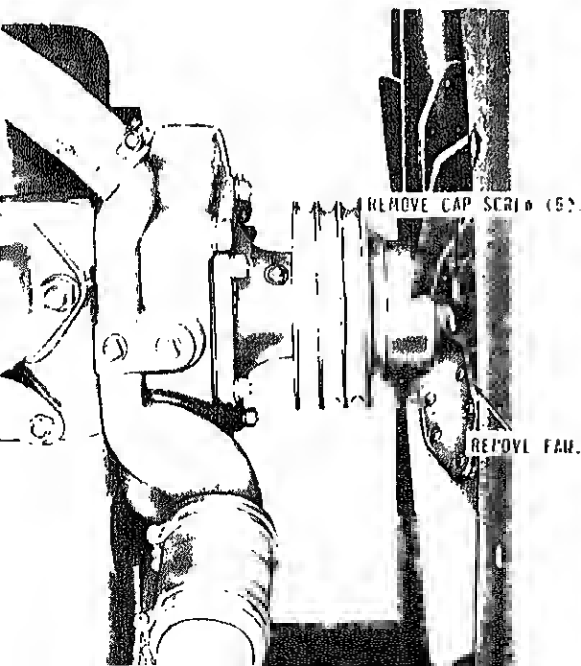
a. *Removal.*

(1) Drain the cooling system (TM 5-3820-205-10/2).

(2) Remove the fan belts (par. 104).

(3) Remove the fan and water pump as instructed on figure 49.

b. *Cleaning and Inspection.* Clean and inspect the fan and water pump for damage. Replace as necessary.



c. *Installation.*

(1) Install the fan and water pump in reverse of instructions on figure 49.

(2) Install the fan belts (par. 104).

(3) Fill the cooling system (TM 5-3820-205-10/2).

106. Radiator Shroud

a. *Removal.*

(1) Drain the cooling system (TM 5-3820-205-10/2).

(2) Remove the engine hood (par. 98).

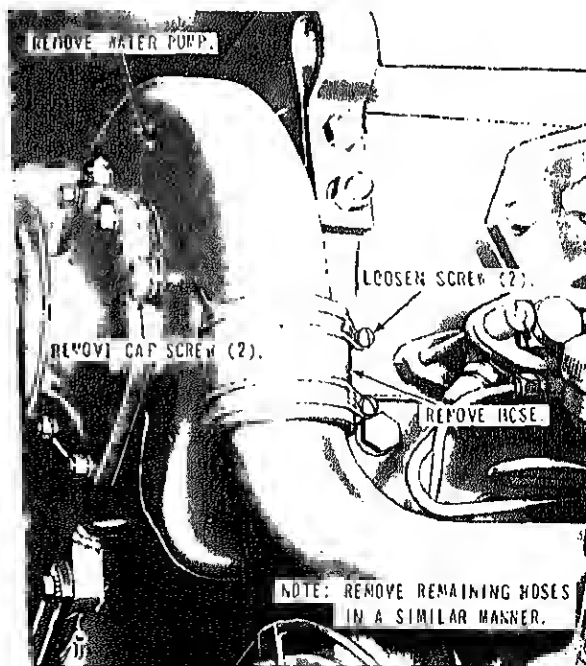
(3) Remove the fan (par. 105).

(4) Remove the radiator shroud as instructed on figure 50.

b. *Cleaning and Inspection.* Clean and inspect the radiator shroud. Replace as necessary.

c. *Installation.*

(1) Install the radiator shroud in reverse of instructions on figure 50.



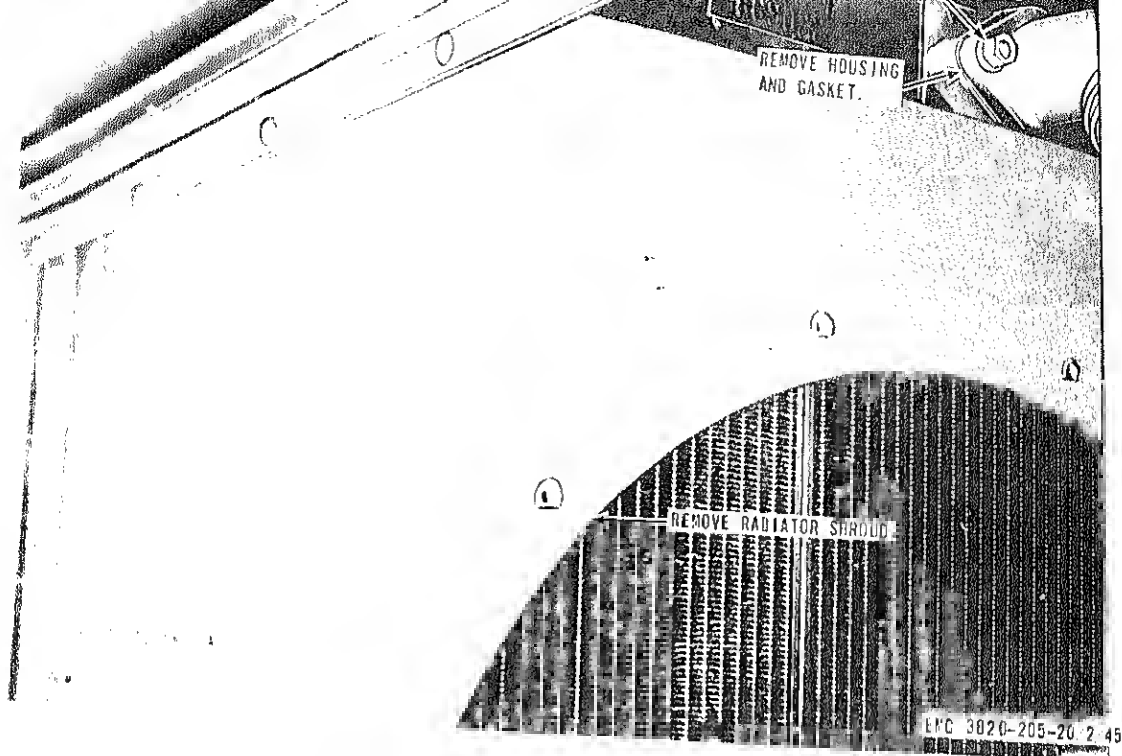


Figure 50. Radiator shroud, removal and installation.

- (1) Remove the fan (par. 105).
- (2) Remove the engine hood (par. 98).
- (3) Fill the cooling system (TM 5-3820-205-10/2).

- (2) Fill the cooling system (TM 5-3820-205-10/2).

108. Water Manifold

a. Removal.

- (1) Drain the cooling system (TM 5-3820-205-10/2).
- (2) Remove the thermostats and housing (par. 107).
- (3) Remove the water manifold as instructed on figure 40.

b. *Cleaning and Inspection.* Clean and inspect the water manifold for any damage. Replace if necessary.

c. Installation.

- (1) Install the water manifold in reverse

107. Thermostat and Housing

- a. *Removal.*
 - (1) Drain the cooling system (TM 5-3820-205-10/2).
 - (2) Remove the thermostat and housing as instructed on figure 51.
- b. *Cleaning and Inspection.* Clean and inspect the thermostats and housing. Replace if necessary.

c. *Installation.* Place the thermostat and suitable amount of water and heat in the thermostat should start to open at 180°-185° F. and be fully open at 180°-185° F. Replace the thermostat.

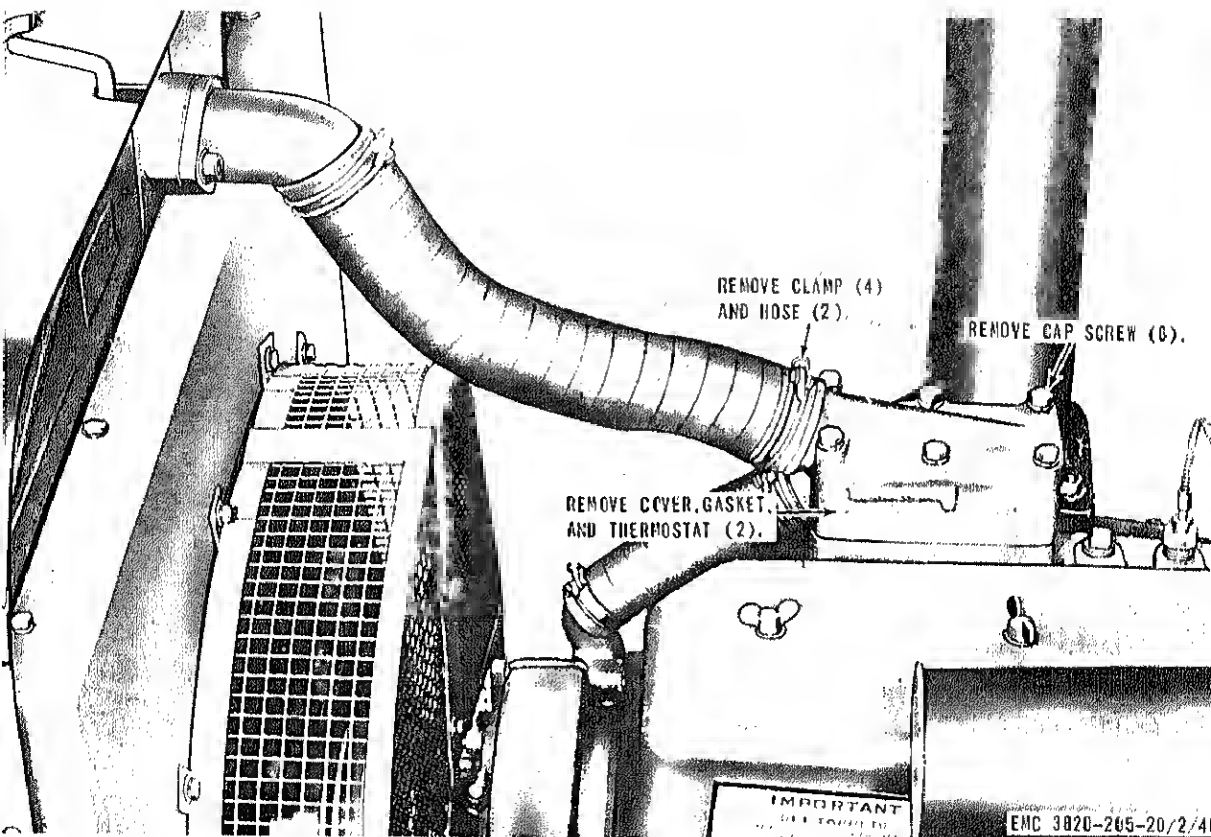
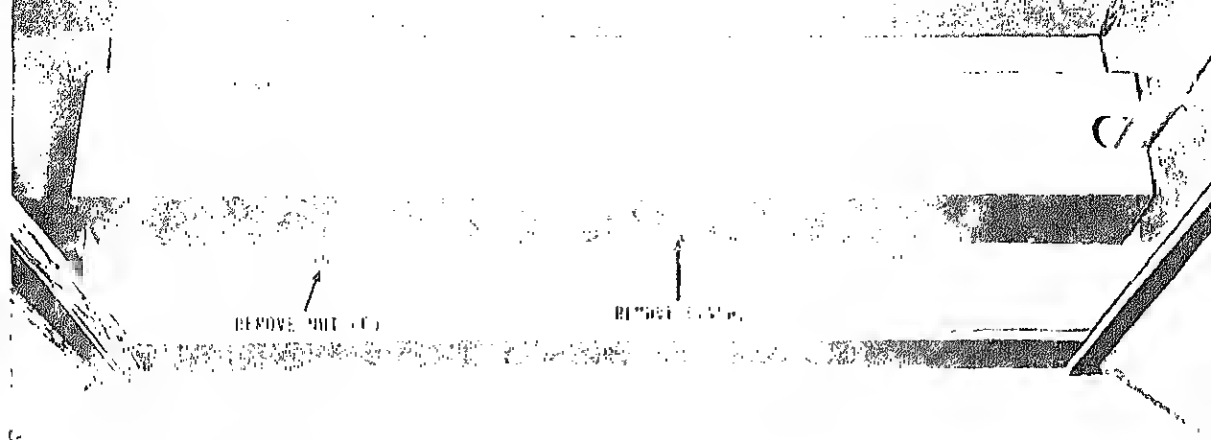
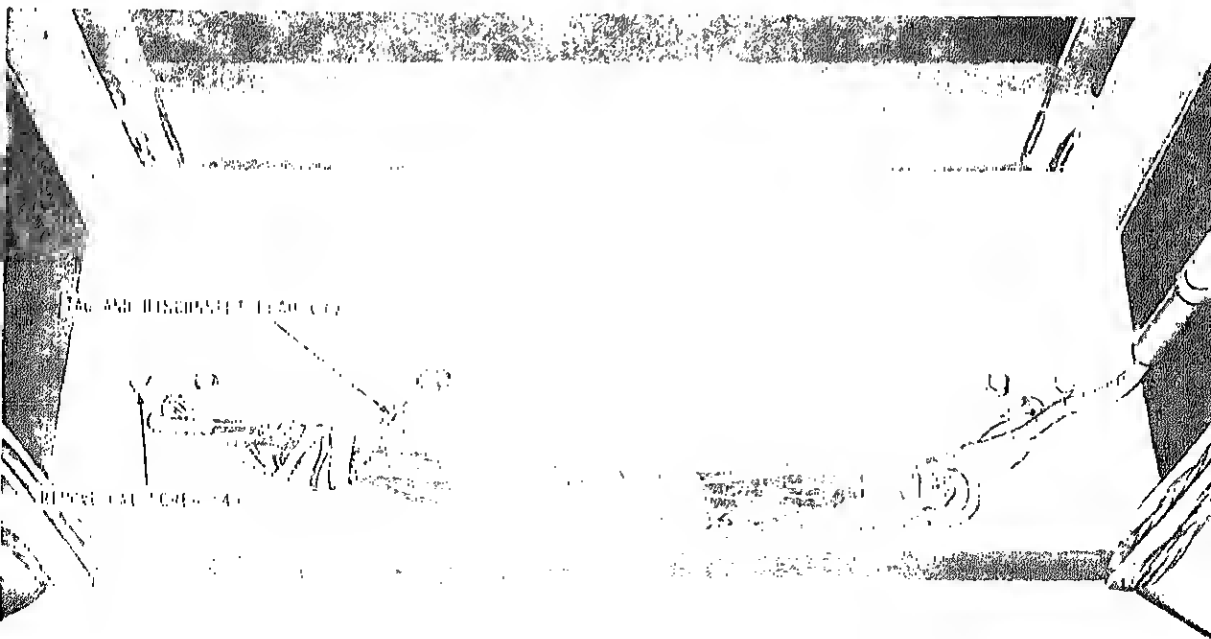


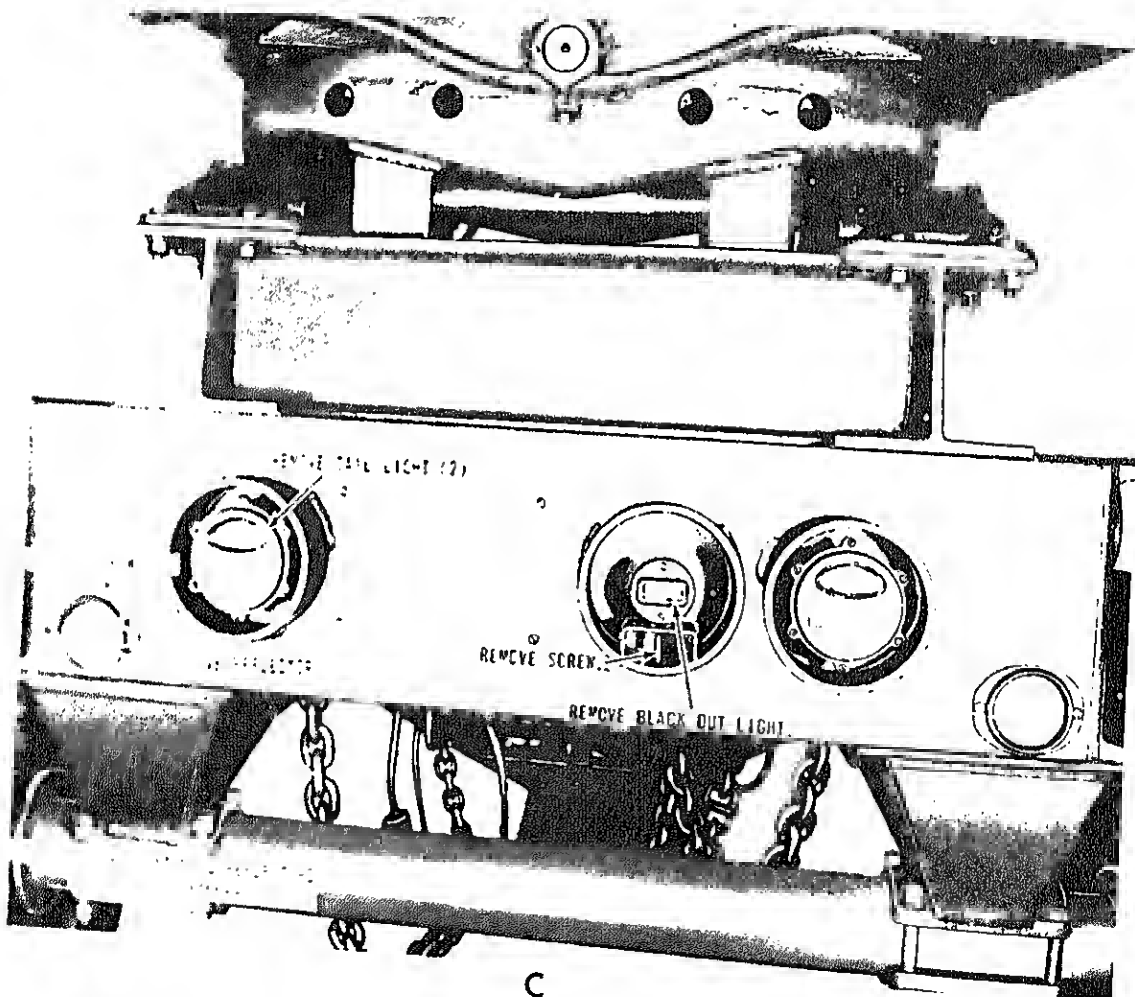
Figure 51. Thermostat and housing, installed view.



A



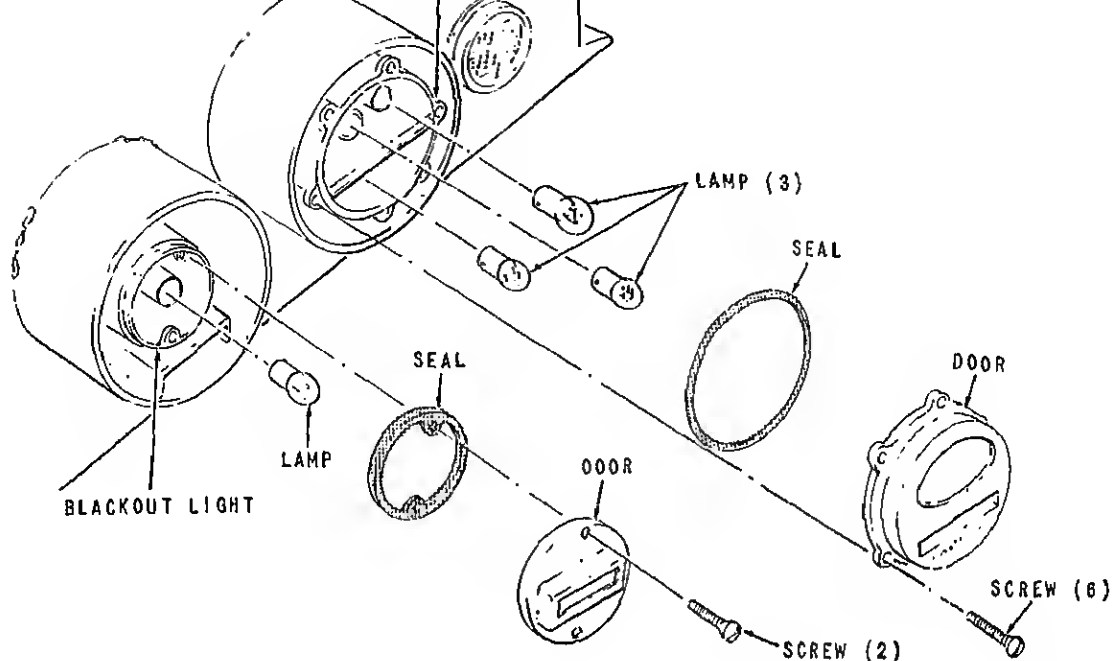
B



ERC 3820-2C5-20 2 48 (2)

1 - 4 Lamps installed

Figure 53—Continued.



EMC 3820-20

Figure 54. Tail and blackout lights, exploded view.

Section II. DOLLY ASSEMBLY

112. General

The dolly assembly consists of a drawbar, lunette, fifth wheel, wheels, and wheel bearing assemblies. The dolly is used to carry the front end of the trailer frame when the unit is being pulled as a full trailer. The fifth wheel includes a jaw-latch mechanism for connecting or disconnecting the dolly assembly from the trailer.

113. Dolly Assembly

a. Removal.

- (1) Crib the jaw crusher (TM 5-3820-205-10/2).
- (2) Remove the dolly assembly as illus-

c. Installation.

- (1) Install the dolly assembly of instructions on figure 55.
- (2) Remove the cribbing (TM 205-10/2).

114. Fifth Wheel

a. Removal.

- (1) Remove the dolly assembly.
- (2) Remove the fifth wheel as on figure 55.

b. Disassembly. Disassemble the as illustrated on figure 56.

c. Cleaning, Inspection, and Repair.

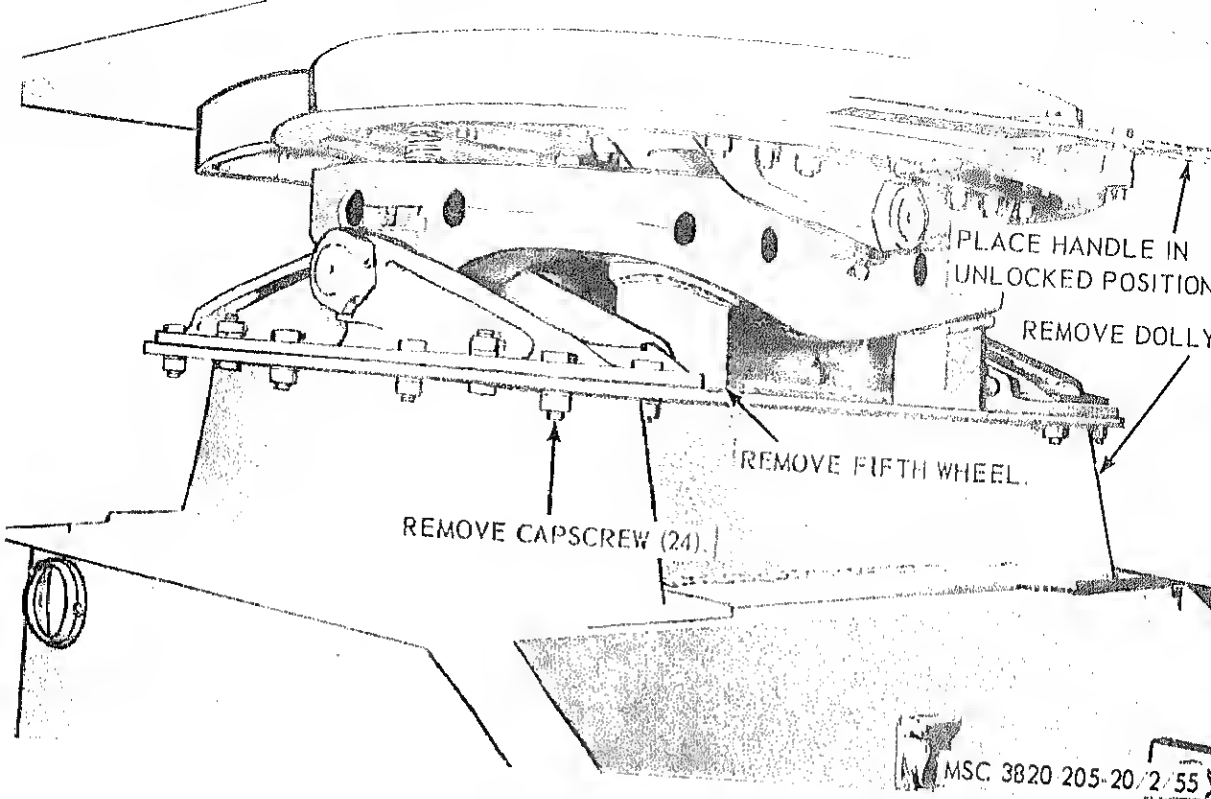


Figure 55. Fifth wheel and dolly assembly, removal and installation.

e. Installation.

- (1) Install the fifth wheel in reverse of instructions on figure 55.
- (2) Install the dolly assembly (par. 113).

15. Dolly Wheels and Tires

a. Removal.

- (1) Use a suitable lifting device and place dolly axle on blocks.
- (2) Remove the dolly wheels and tires as instructed on figure 57.

b. Cleaning, Inspection, and Repair.

- (1) Clean studs and nuts with an approved cleaning solvent and dry thoroughly.
- (2) Clean hub, wheel faces, and nut cavity.

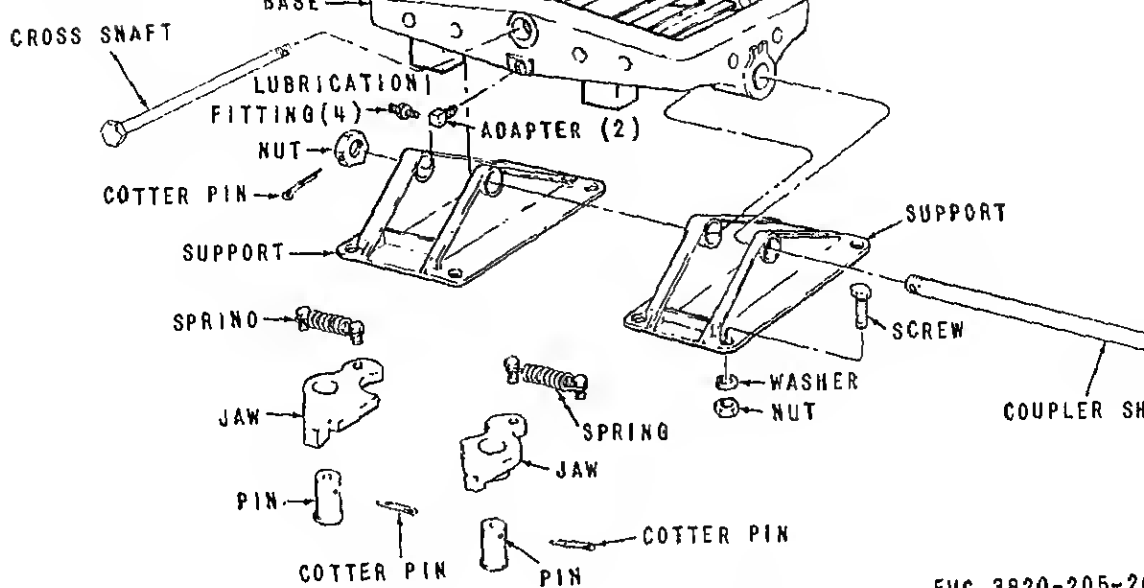
Repair tires and tubes as instructed in TM 9-1870-1.

c. Installation.

- (1) Install inner wheel on hub.

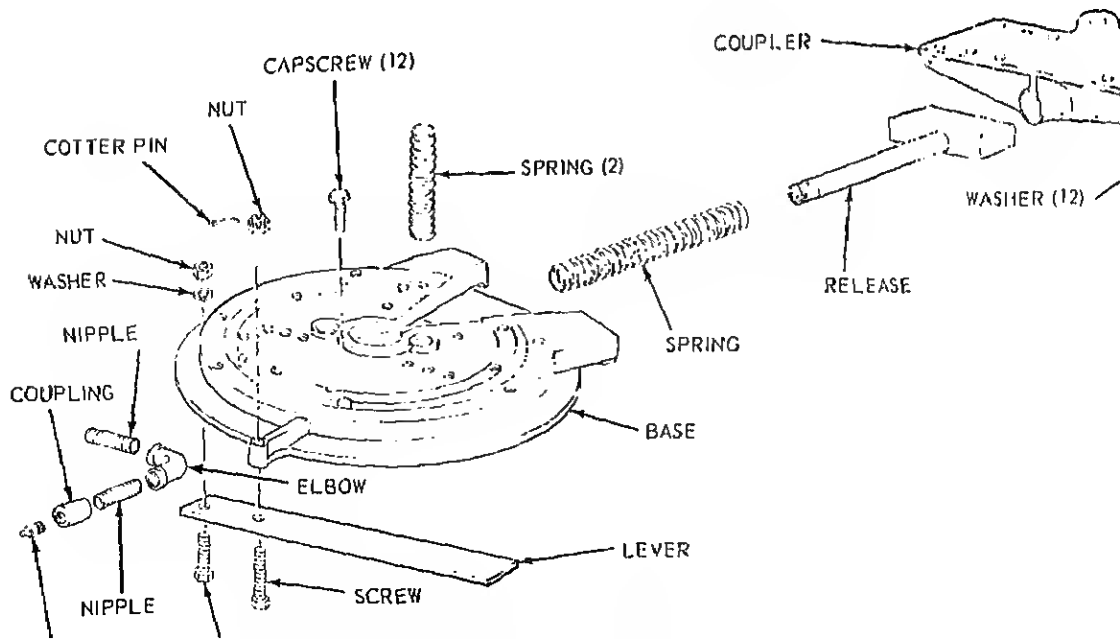
Note. Number the studs 1 to 6.

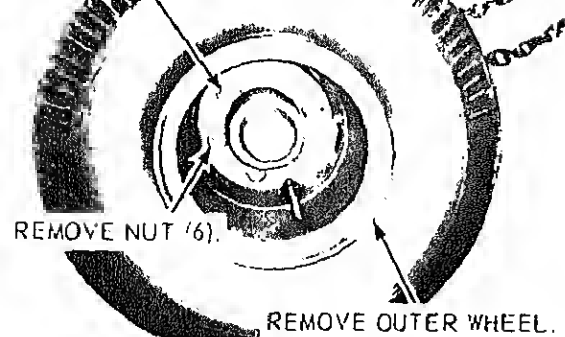
- (2) Install inner capnuts on studs 1 and 4 and torque to 150 to 200 foot-pounds.
- (3) Install the remaining capnuts and torque Nos. 2, 5, 3, and 6 to 500 to 600 foot-pounds in that order. Retorque Nos. 1 and 4 to 500 to 600 foot-pounds.
- (4) Install the outer wheel assembly making sure that the outer wheel valve stem is opposite the inner valve stem.
- (5) Install two outer nuts on opposite



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Figure 56. Fifth wheel, exploded view.





MSC 3820-205-20 1 56

Figure 57. Dolly wheel, removal and installation.

and torque to 500 to 600 foot-pounds in the sequence outlined above.

- (7) Remove the two outer nuts (5) above and reinstall with washers and torque to 500 to 600 foot-pounds.
- (8) Remove the dolly from the blocks using a suitable lifting device and road test approximately 10 miles. After first mile, fifth mile, and tenth mile retorque inner and then outer nuts to 500 to 600 foot-pounds. If at the tenth mile torque value has dropped below 400 foot-pounds, remove wheels, investigate, and repeat entire procedure.

Caution: A trestle (Motor Vehicle Maintenance, 5-ton) will be used in final torquing operations, taking care that drive extensions are parallel to the ground at all times.

6. Wheel Bearing and Hub Assemblies

a. Removal and Disassembly.

- (1) Remove the dolly wheels (par. 115).
- (2) Remove and disassemble the wheel bearings and hub assembly as illustrated on figure 58.

Note. Install hubs with right-hand stubs on right side of the vehicle and hubs with left-hand stubs on left side of the vehicle.

- (2) Install the wheel bearing adjusting nut. Screw the nut against the bearing as the wheel is revolved. Be sure there is sufficient clearance between the brakeshoe and drum so brakeshoe drag will not interfere with the bearing adjustment.
- (3) Tighten the adjusting nut to 50-foot-pounds torque while the wheel is being rotated. Rotate the wheel in both directions to correctly position the bearings.
- (4) Back off adjusting nut $\frac{1}{4}$ to $\frac{1}{2}$ turn, and install the adjusting nut lockwasher. If the holes in lockwasher do not fit dowel protruding from adjusting nut, the washer may be removed and turned over, which changes hole locations.
- (5) Install the outer locknut and torque to 250 to 400 foot-pounds.

Note. The use of an impact wrench is discouraged; however, if used, the final torquing will be accomplished by hand using a smooth downward effort.

117. Air Hoses and Fittings

a. *Removal.* Remove the air hoses as illustrated on figure 59.

Note. On units of equipment within serial No. range 2090 through 2129 the hoses and cable are suspended by the Flexo-Stick assembly.

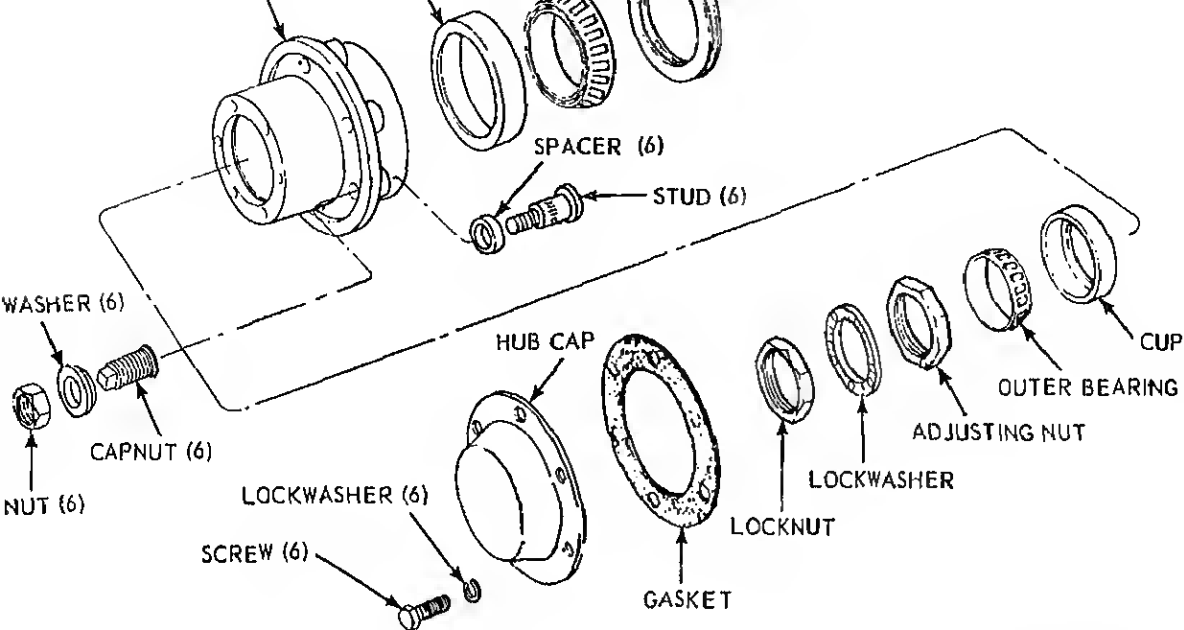
b. *Cleaning and Inspection.* Clean and inspect all air hoses and fittings for damage or deterioration. Replace as required.

c. *Installation.* Install the air hoses and fittings in reverse of instructions on figure 59.

118. Drawbar

a. Removal.

- (1) Remove Flexo-Stick assembly from



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Figure 58. Wheel bearing and hub assembly, exploded view.

b. Cleaning and Inspection. Clean and inspect the drawbar for damage. Replace if necessary.

c. Installation.

- (1) Install the drawbar in reverse of instructions on figure 59.
- (2) Install Flexo-Stick assembly on the drawbar (TM 5-3820-205-10/2).

119. Lunette

a. Removal. Remove the lunette as instructed on figure 59.

b. Cleaning and Inspection. Clean and inspect the lunette for wear. Replace if necessary.

c. Installation. Install the lunette in reverse

120. Reflectors

a. Removal. Remove reflectors as instructed on figure 53.

b. Cleaning and Inspection. Clean and inspect reflectors for damage. Replace damaged reflectors as necessary.

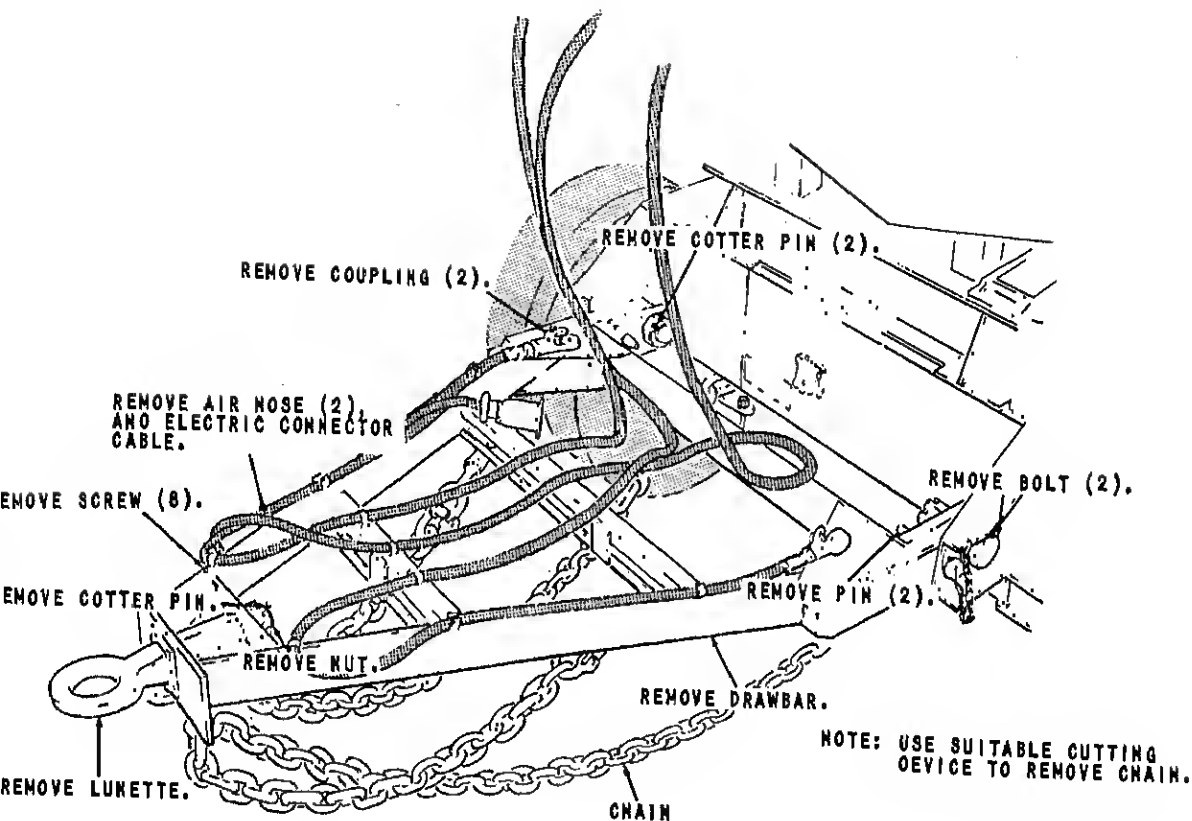
c. Installation. Install the reflector in reverse of instructions on figure 53.

121. Safety Chains

a. Removal. Remove the safety chains as instructed on figure 59.

b. Cleaning, Inspection, and Repair. Clean and inspect the safety chains for wear and damage. Repair by welding, or use repair links or suitable heavy clevises.

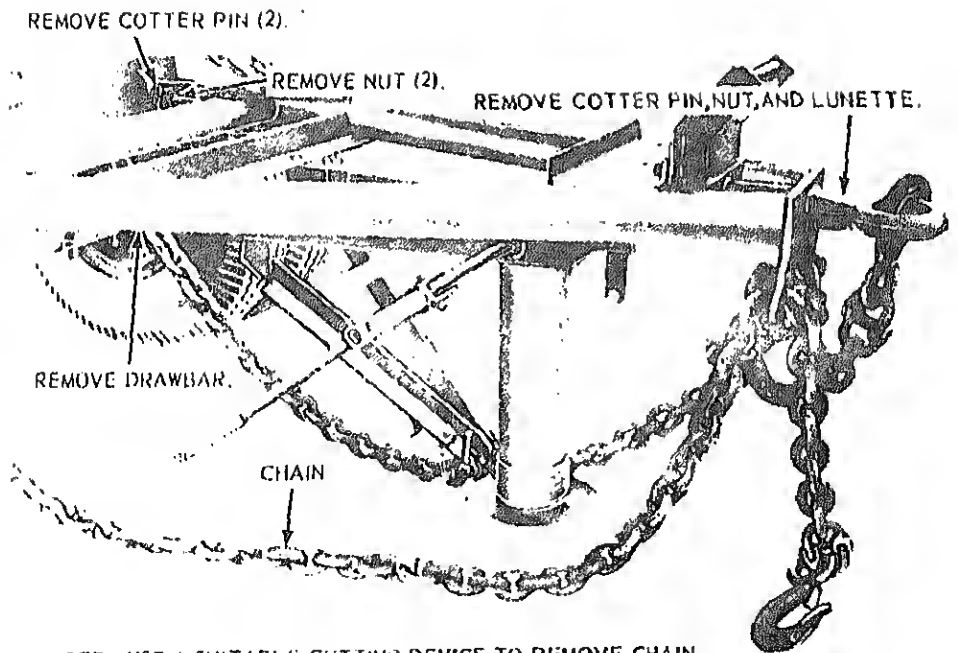
c. Installation. Install the safety chain



EMC 3820-206-20/2/54

1 Serial No. 2060 through 2087

Figure 59. Drawbar, air hose, fittings, safety chain, and lunette, removal and installation.



NOTE: USE A SUITABLE CUTTING DEVICE TO REMOVE CHAIN.

MSC 3820-205-20/2/59 (2)

2 Serial No. 2090 through 2120

Figure 59--Continued.

CHAPTER 6

CRUSHER MAINTENANCE INSTRUCTIONS

Section I. CRUSHER ELECTRICAL SYSTEM

122. General

The crusher electrical system is comprised of two separate systems. The 24-volt chassis electrical system consists of taillights, blackout light, clearance or marker lights, and necessary wiring to complete the circuit. This system derives its power from the crusher prime mover. The crusher motors electrical system consists of three 10-horsepower electrical motors, an operator's control box, main electrical control panel, and necessary wiring, switches, and electrical hardware to complete the circuits.

123. Taillights

a. Removal and Disassembly. Remove and disassemble the taillights (par. 111).

b. Cleaning, Inspection, and Repair. Clean, inspect, and repair taillight (par. 111).

c. Reassembly and Installation. Reassembly and install taillights (par. 111).

124. Blackout Taillight

a. Removal. Remove the blackout taillight (par. 111).

b. Cleaning, Inspection, and Repair. Clean, inspect, and repair the blackout taillight (par. 111).

c. Installation. Install the blackout taillight (par. 111).

125. Clearance (Marker) Lights and Electrical Conduit

a. Removal. Remove the clearance lights and

c. Cleaning, Inspection, and Repair. Clean and inspect all parts for breaks, cracks, loose or missing hardware, corrosion, and frayed or damaged insulation. Repair or replace if necessary.

d. Reassembly. Reassemble the clearance lights as illustrated on figure 61.

e. Installation. Install the clearance lights and electrical conduit in reverse of instructions on figure 60.

126. Crusher Electrical Connector

a. Removal. Remove the crusher electrical connector (par. 110).

b. Cleaning, Inspection, and Repair. Clean, inspect and repair the crusher electrical connector.

c. Installation. Install the crusher electrical connector (par. 110).

127. Pan Feeder Drive Motor, Belts, and Turn Buckle Assembly

a. Removal.

(1) Remove the pan feeder motor as instructed on figure 62.

(2) Remove the turn buckle assembly illustrated on figure 62.

b. Cleaning, Inspection, and Repair. Clean and inspect all parts for loose or missing hardware and defective or damaged parts. Replace a defective part.

c. Installation.

(1) Install the pan feeder motor and drive

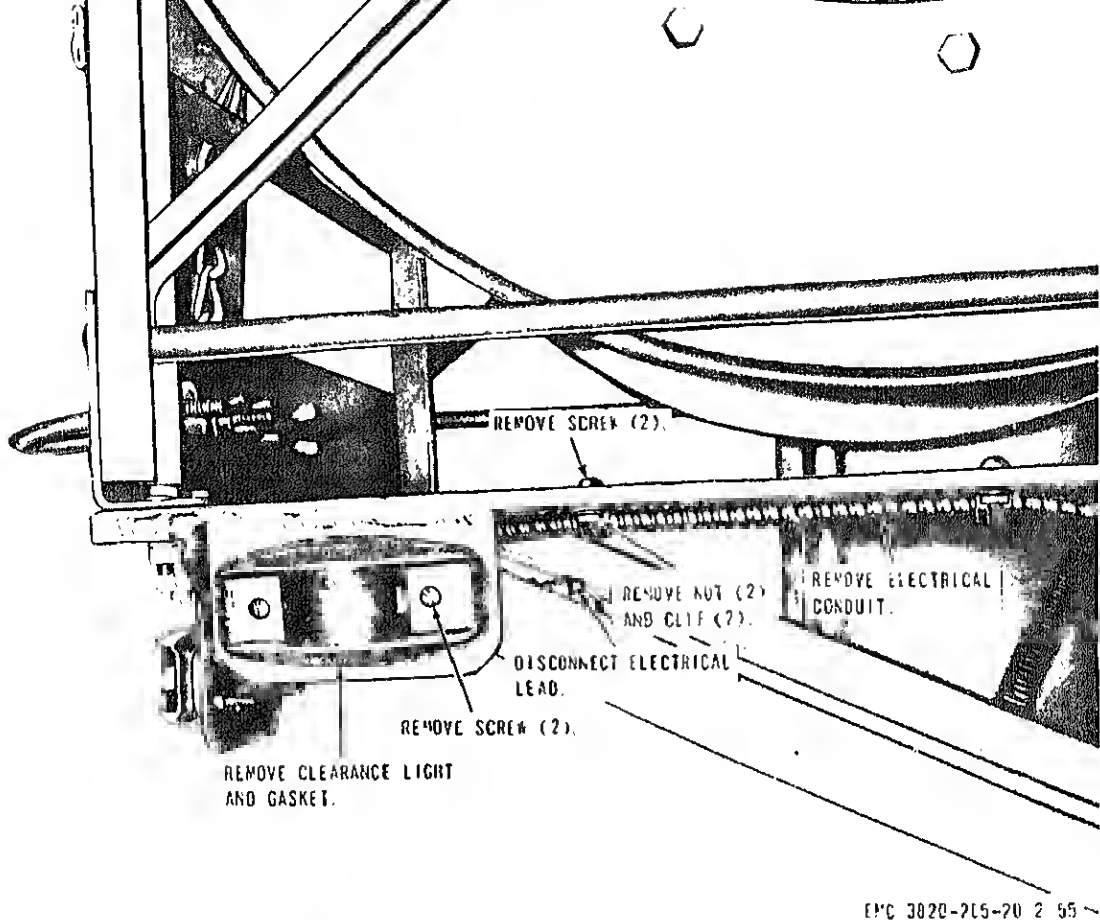


Figure 60. Clearance light and electrical conduit, removal and installation.

Scalper Vibrating Screen Drive Motor and Belts

Removal.

- (1) Remove the belt guard (TM 5-3820-205-10/2).
- (2) Remove the scalper vibrating screen drive motor and belts as instructed on figure 63.

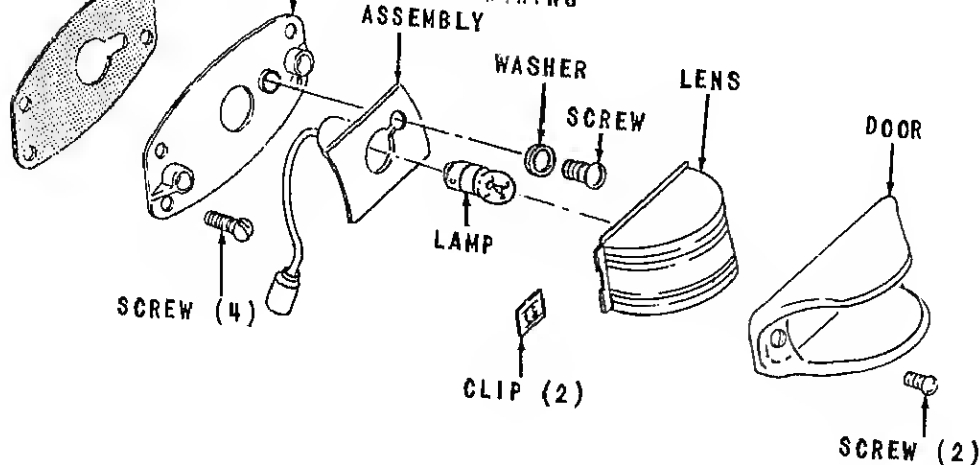
Cleaning and Inspection. Clean all parts inspect for loose or missing hardware and aged or defective parts. Replace a defec-

129. Discharge Conveyor Drive Motor and Belts

a. Removal. Remove the discharge conveyor drive motor and belts as instructed on figure 62.

b. Cleaning and Inspection. Clean all parts and inspect for loose or missing hardware, and damaged or defective parts. Replace defective parts as necessary.

c. Installation. Install the discharge conveyor motor and drive belts in reverse of the instructions on figure 62.



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Figure 61. Clearance light, exploded view.

ther damage. Replace a defective or damaged heater or magnetic starter if necessary.

Installation. Install the magnetic starter in reverse of instructions on figure 64.

Pushbutton Controls

Removal. Remove pushbutton controls as instructed on figure 65.

Cleaning and Inspection. Clean and inspect all parts. Replace a damaged or defective pushbutton control if necessary.

Installation. Install the pushbutton control in reverse of instructions on figure 65.

Power Cable

Removal. Remove the power cable from the cable reel (TM 5-3820-205-10/2).

Cleaning and Inspection. Clean and inspect

the power cable for cut or deteriorated insulation, breaks, damaged connectors, or other damage. Replace a defective or damaged power cable.

c. Installation. Install the power cable on the cable reel (TM 5-3820-205-10/2).

133. Main Electrical Emergency Stop Control Button

a. Removal. Remove the main electrical emergency stop control button as instructed on figure 65.

b. Cleaning and Inspection. Clean and inspect all parts. Replace a defective or damaged part as necessary.

c. Installation. Install the main electrical emergency stop control button in reverse of instructions on figure 65.

NOTE: REMOVE THE MAIN CONVEYOR MOTOR BELTS AND MOUNTING IN A SIMILAR MANNER

NOTE: REMOVE SCREW AND JUNCTION

REMOVE COVER TAG AND DISCONNECT ELECTRICAL LEADS.

REMOVE SCREW (2)

DISCONNECT WIREBOLT CONNECTOR FROM ELEVATOR AND REMOVE LEADS FROM JUNCTION BOX

REMOVE CAP SCREW (4)

REMOVE DUST SHIELD.

DRIVE BELT

REMOVE CAP SCREW (4)

REMOVE MOTOR

GEAR HOUSING

EN LOCKING PIN (2) BY TOP OF HOUSING. PUSH HOUSING IN TO LOCK AND REMOVE DRIVE

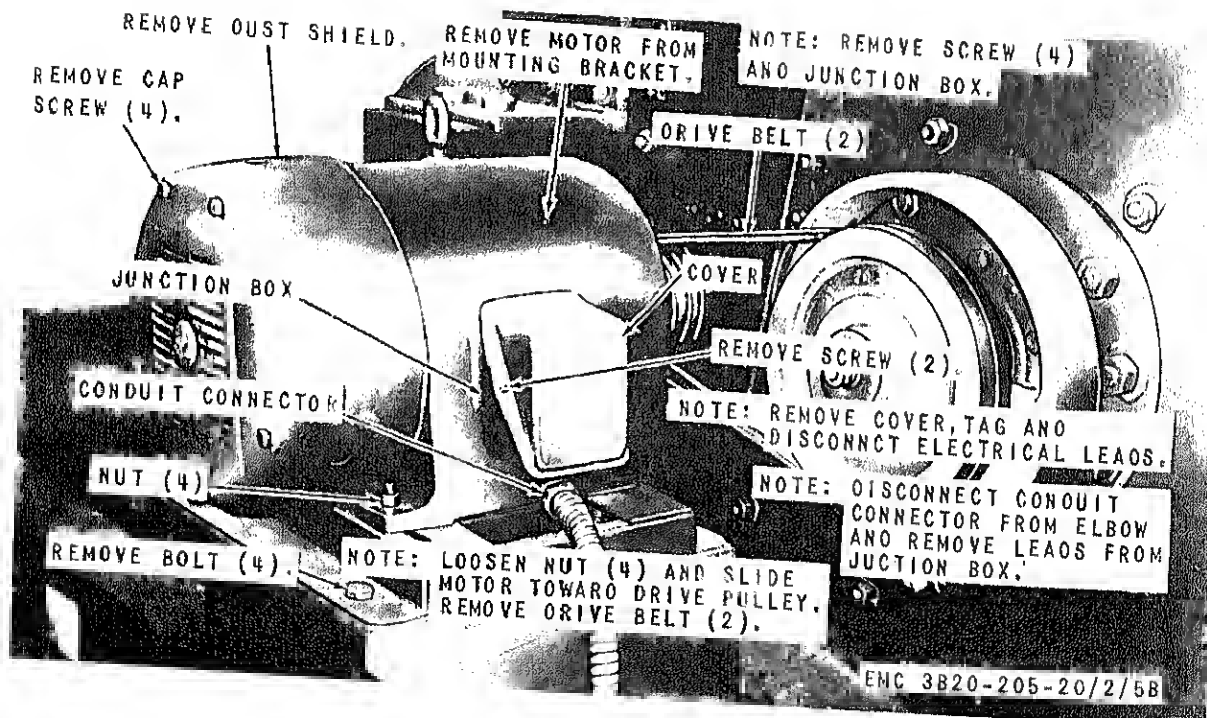
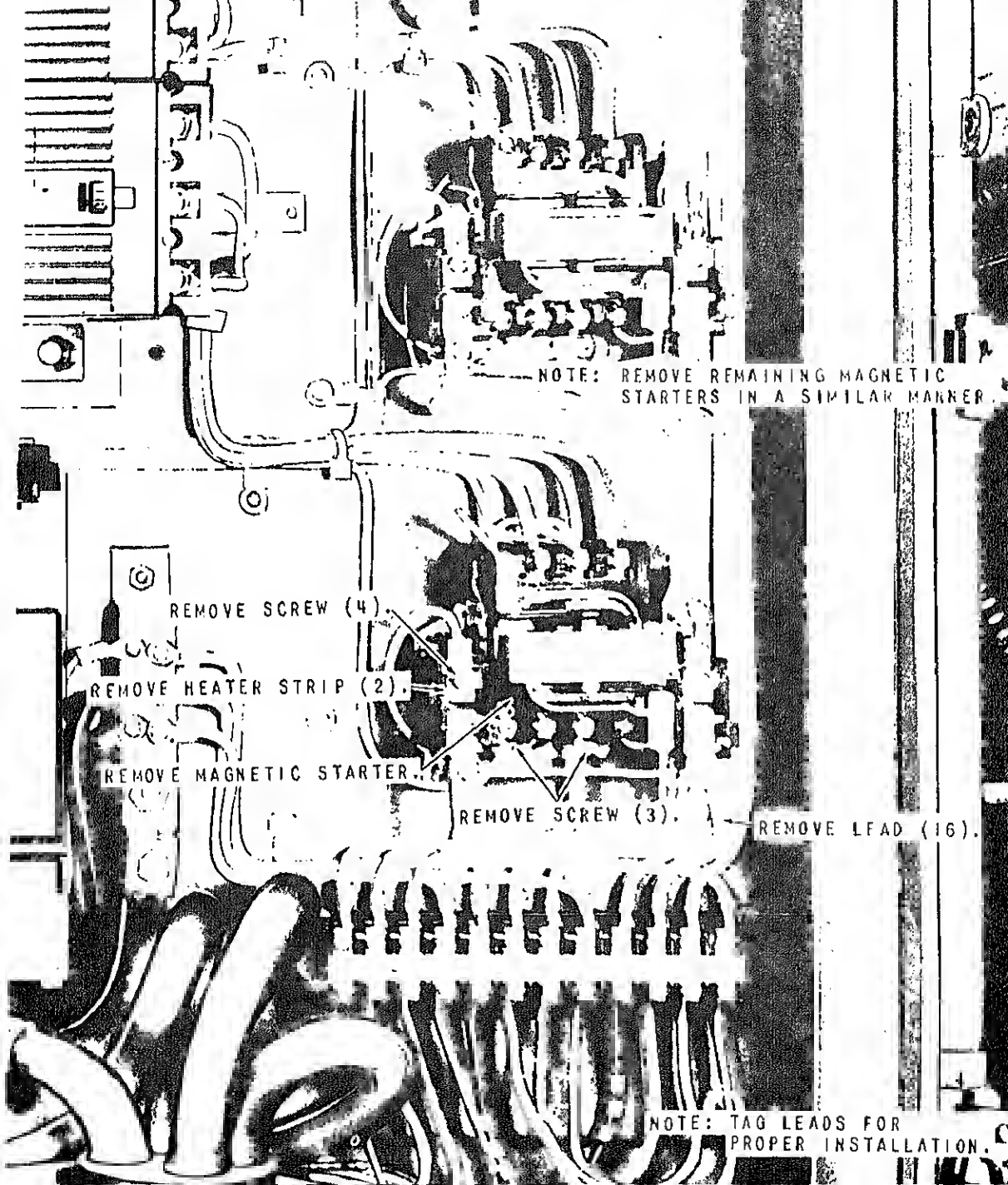


Figure 63. Scalper vibrator screen drive motor and belts, removal and installation.



NOTE: REMOVE REMAINING MAGNETIC
STARTERS IN A SIMILAR MANNER.

REMOVE SCREW (4).

REMOVE HEATER STRIP (2).

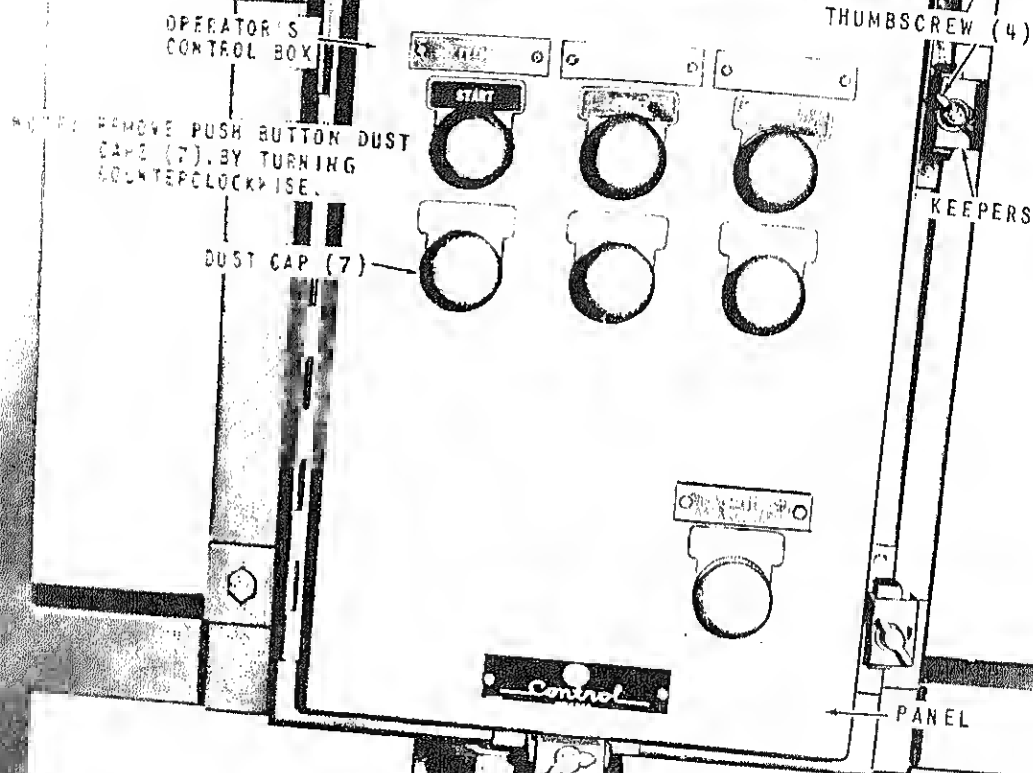
REMOVE MAGNETIC STARTER.

REMOVE SCREW (3).

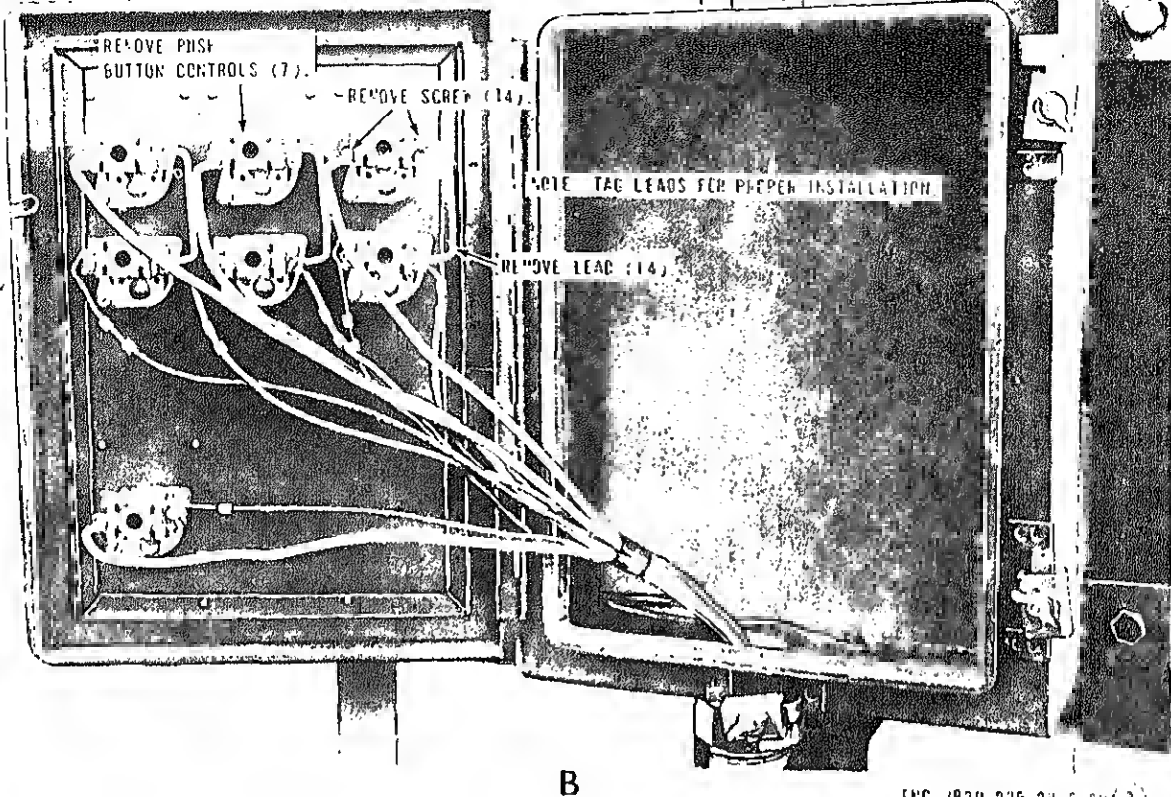
REMOVE LEAD (16).

NOTE: TAG LEADS FOR
PROPER INSTALLATION.

NOTE: LOOSEN THUMBSCREWS (4),
SLIDE KEEPERS AWAY FROM
OPERATOR'S CONTROL BOX
AND SWING PANEL OPEN.



NOTE: REMOVE MAIN CONTROL PANEL SAFETY
CUTOUT BUTTON IN A SIMILAR MANNER.



B Operator's control box rear view

Figure 65—Continued.

Section II. HYDRAULIC SYSTEM

General

The crusher hydraulic system includes a tank and an internally mounted, hand operated pump. A hose with a manually operated valve connects the pump to the five stage hydraulic cylinder used to raise or lower the pan feeder assembly.

Hydraulic Hose, Pump, and Valve

Removal.

(1) Drain the hydraulic system (TM 5-

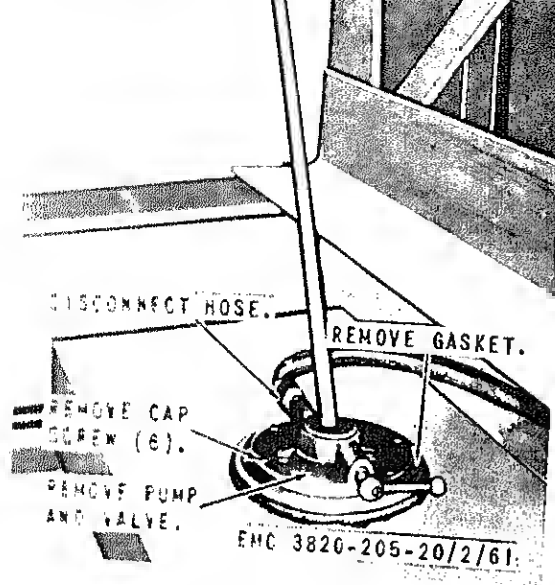
e. *Cleaning, Inspection, and Repair.* Clean and inspect all parts. Replace or repair all damaged parts.

d. *Reassembly.* Reassemble the hydraulic pump and valve as illustrated on figure 67.

e. *Installation.*

(1) Install the hose, pump, and valve in reverse of instructions on figure 66.

(2) Fill the hydraulic system (TM 5-3820-205-10/2).



Hydraulic hose, pump, and valve, installed

c. *Cleaning and Inspection.* Clean and inspect all parts. Replace all damaged parts.

c. *Installation.*

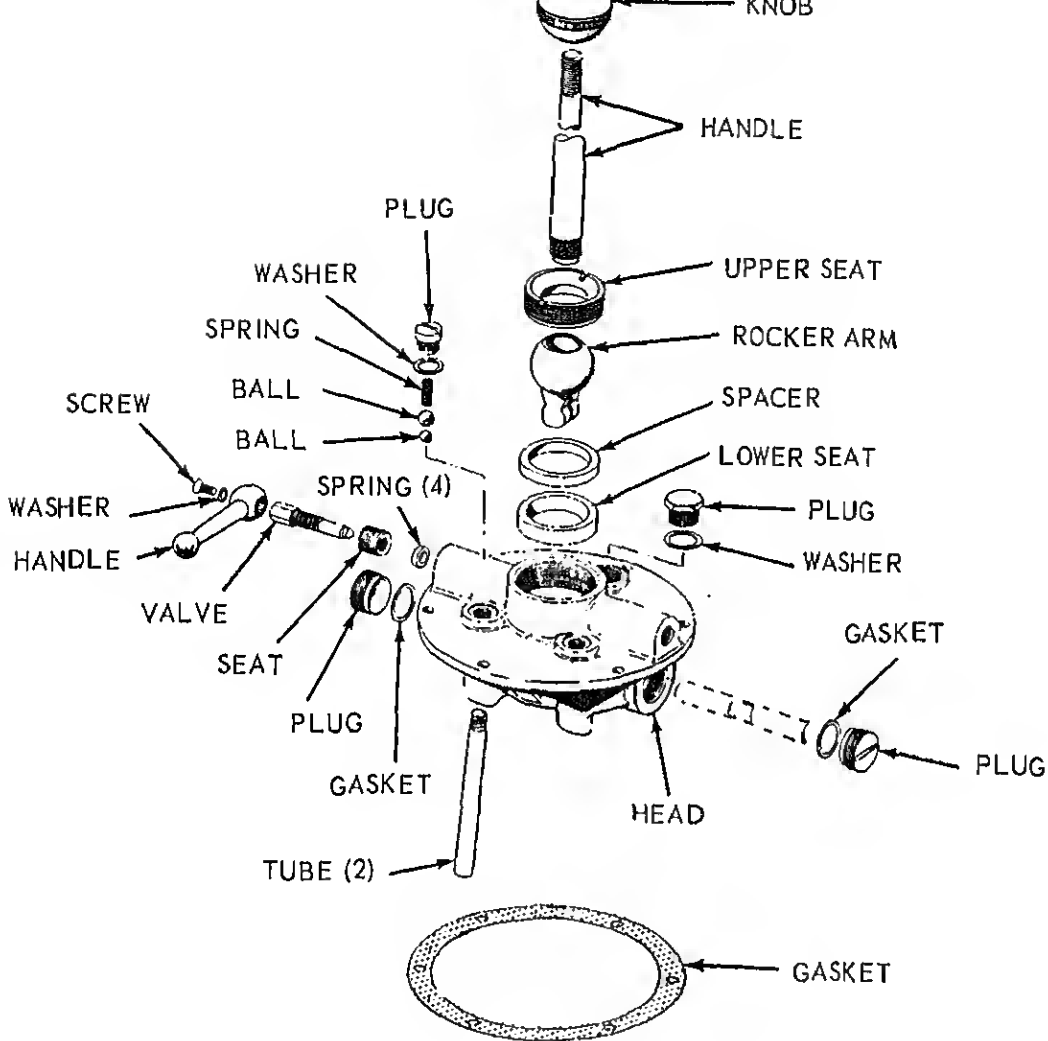
- (1) Install the hydraulic tank and pump in reverse of instructions on figure 68.
- (2) Install the hose, pump, and valve (par. 135).

137. Hydraulic Cylinder and Hose

a. *Removal.* Remove the hydraulic cylinder and hose as instructed on figure 69.

b. *Cleaning and Inspection.* Clean and inspect all parts. Replace all damaged parts.

c. *Installation.* Install the hydraulic cylinder and hose in reverse of instructions on figure 69.



MSC 3820-205-20/2/67

Figure 67. Hydraulic pump and valve, exploded view.

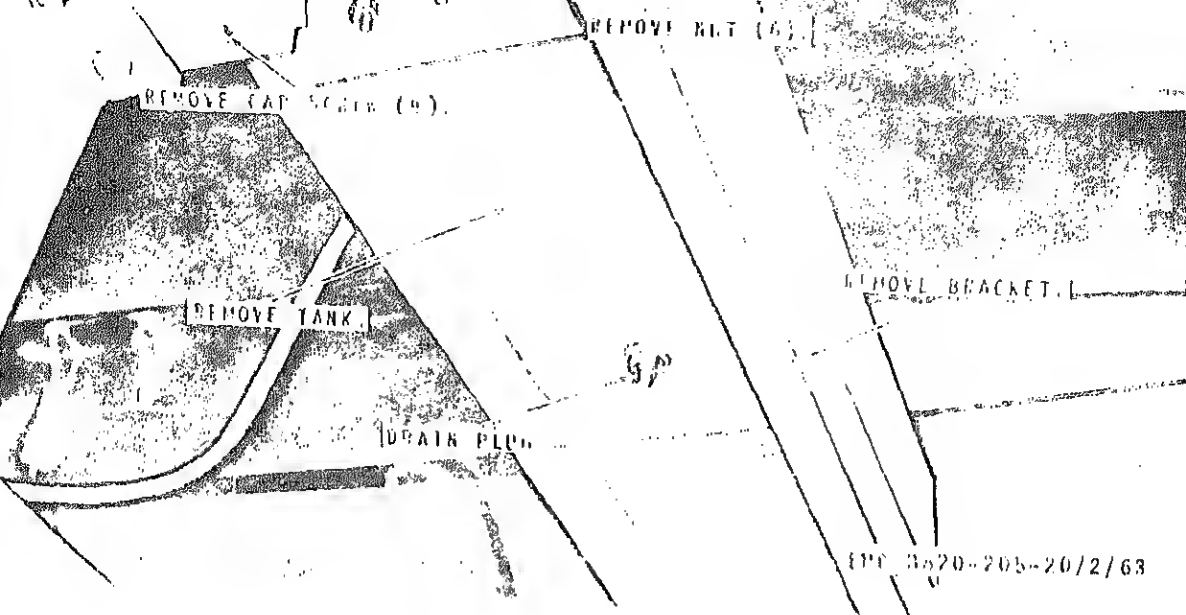
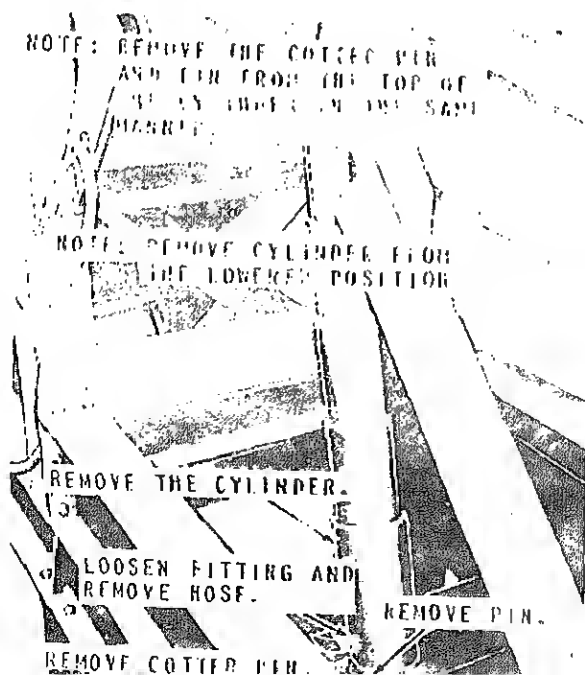


Figure 48. Hydraulic tool and bracket, installed view.



138. General

The air system consists of the hose, lines, valves, filters, chambers, and air tank. The air system is used to actuate the brakes when the law crusher is being towed from one location to another.

139. Air Brake Chamber

a. Removal. Remove the air brake chamber as instructed on figure 70.

b. Cleaning and Inspection. Clean and inspect all parts. Replace a defective air brake chamber.

c. Installation. Install the air brake chamber in reverse of instructions on figure 70.

140. Relay Valve

a. Removal. Remove the relay valve as instructed on figure 71.

Inspect the relay valve. Replace a defective relay valve.

c. Installation. Install the relay valve in reverse of instructions on figure 71.

141. Air Filter

a. Removal. Remove the air filter as instructed on figure 72.

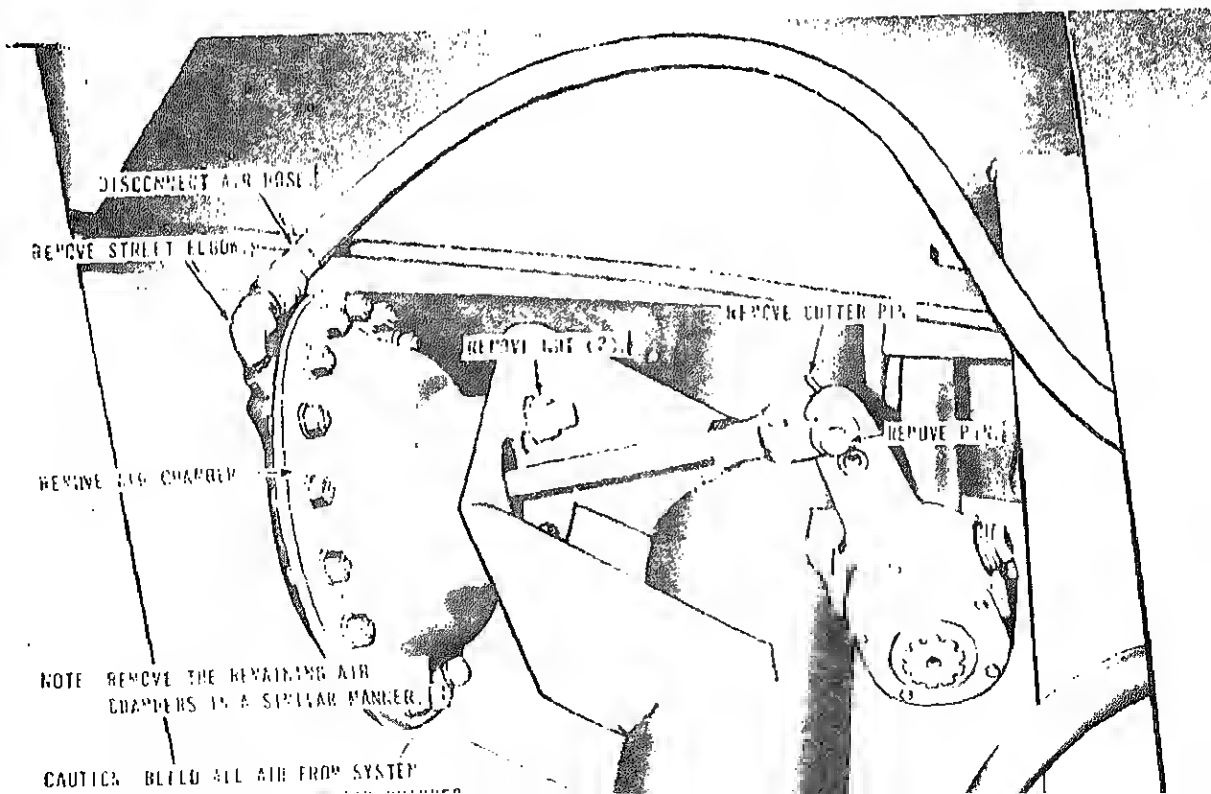
b. Cleaning and Inspection. Clean and inspect the air filters. Replace a defective filter.

c. Installation. Install the air filter in reverse of instructions on figure 72.

142. Air Tank

a. Removal. Remove the air tank as instructed on figure 73.

b. Cleaning and Inspection. Clean and inspect the air tank. Replace a defective air tank.



CAUTION BLEED AIR FROM SYSTEM
BEFORE DISCONNECTING
AIR HOSE.

REMOVE NUT (2).

REMOVE PIN.

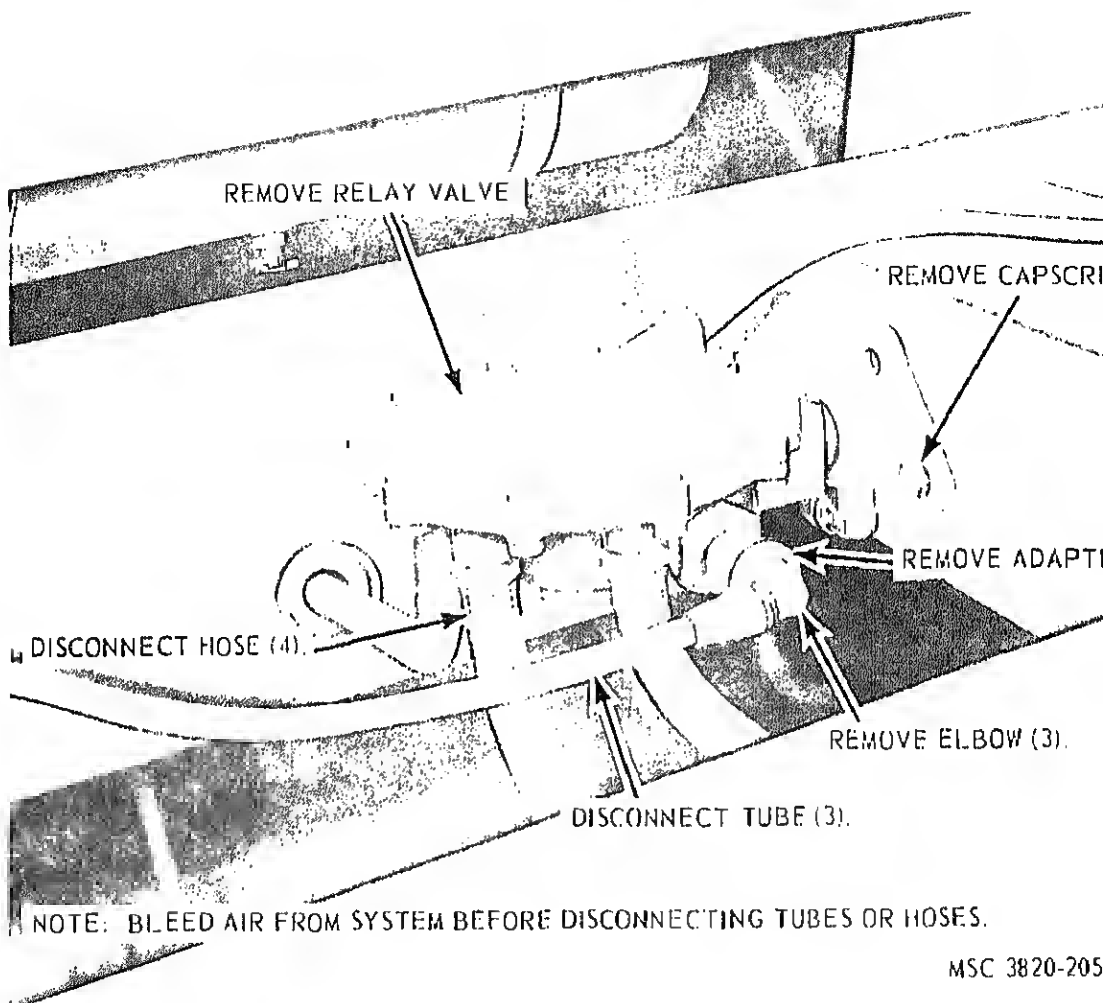
DISCONNECT AIR HOSE.

NOTE: REMOVE THE REMAINING AIR
CHAMBERS IN A SIMILAR
MANNER.

MSC 3820-205-20 1 70 ②

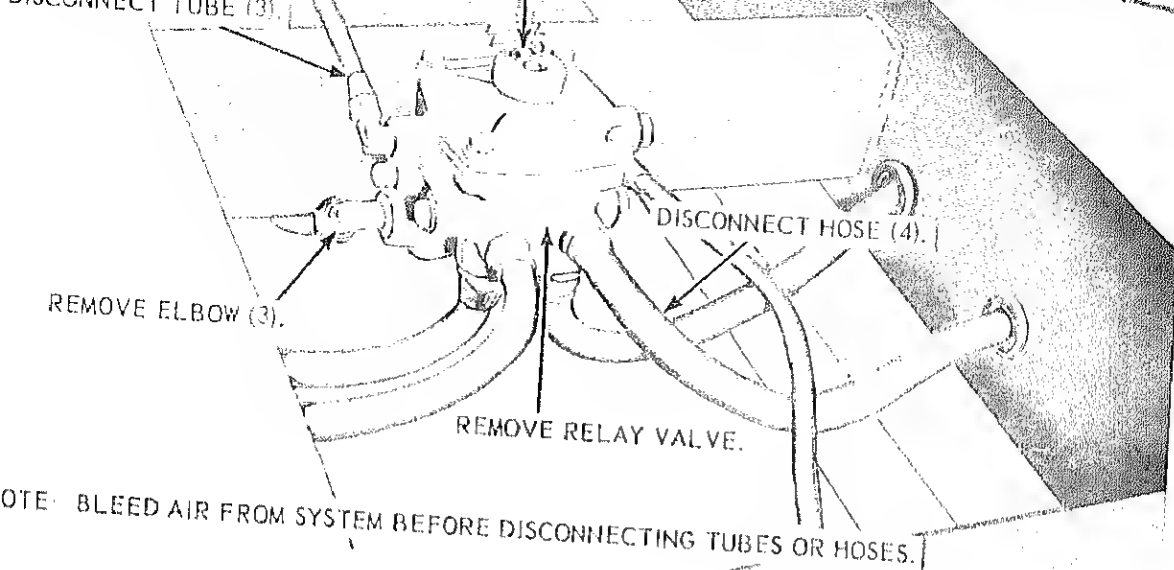
2 Serial No. 10000 2600 through 2129

Figure 70—Continued.



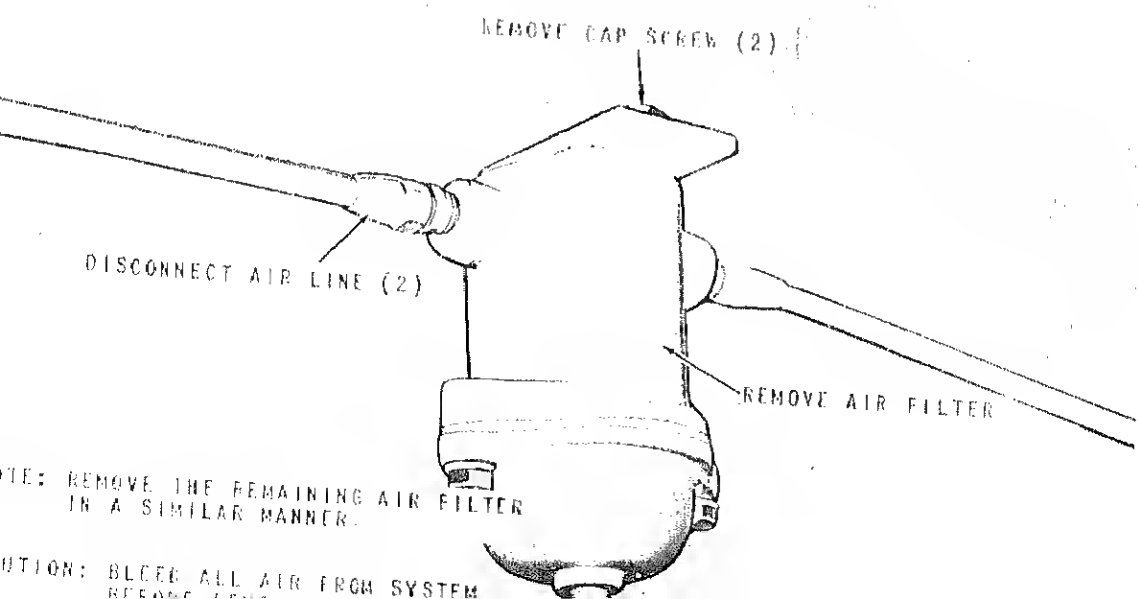
A On units of equipment within serial No. range 2050 through 2087 only

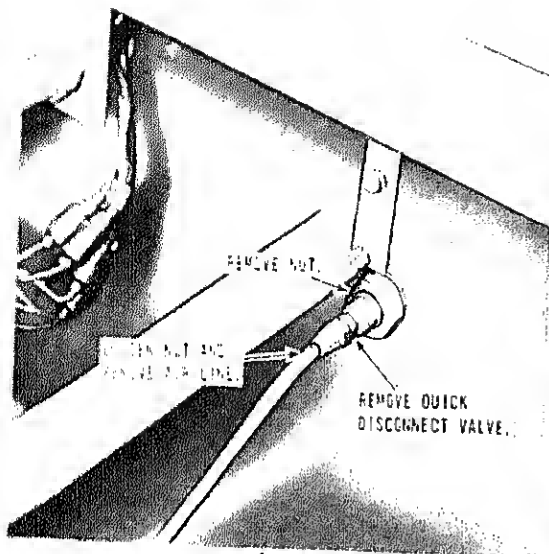
Figure 71. Relay valve, installed view.



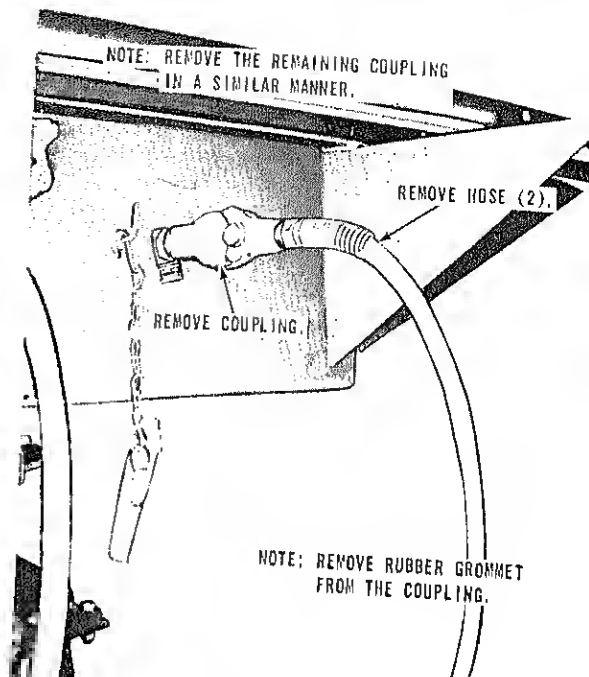
MSC 3820-205-20/2/71 ②

B—On units of equipment within serial No. range 2090 through 2129 only
 Figure 71—Continued.





A



B

EMC 3820-205-20/2-60

A—Couplings rear view

B—Couplings front view

Figure 74. Couplings and hoses, removal and installation.

Section IV. PAN FEEDER ASSEMBLY

144. General

The pan feeder initially receives the rock to be crushed and feeds it into the scalper vibrating screen assembly. The pan feeder assembly consists of a hopper, an electric motor, motor drive belts, reducer gears, drive sheaves, sprockets, frame and an apron which is made up of bars, pins, rollers, and pans assembled together to form an endless metal belt.

145. Pan Feeder Apron.

a. *General.* Remove the pan feeder apron as constructed on figure 75.

b. *Cleaning, Inspection, and Repair.* Clean and inspect all parts. Pay particular attention to the bearings of the rollers and the end pans. Reweld any loose end pan welds. Replace a defective or damaged part as necessary.

c. *Installation.* Install the pan feeder apron in reverse of the instructions on figure 75.

d. *Adjustment.* Adjust the tension of the pan feeder apron as constructed on figure 75.

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a. *Removal.* Remove the scalper vibrating screen rubber deflectors as instructed on figure 77.

b. *Cleaning and Inspection.* Clean and inspect all parts. Inspect the rubber deflectors for cuts, tears, or signs of deterioration. Replace a damaged or defective part as necessary.

c. *Installation.* Install the scalper vibrating screen rubber deflectors in reverse of the instructions on figure 77.

150. Grizzly Bars

a. *Removal.* Remove the grizzly bars as instructed on figure 78.

b. *Cleaning and Inspection.* Clean and inspect all parts. Replace a damaged parts as required.

c. *Installation.* Install the grizzly bars in reverse of instructions on figure 78.

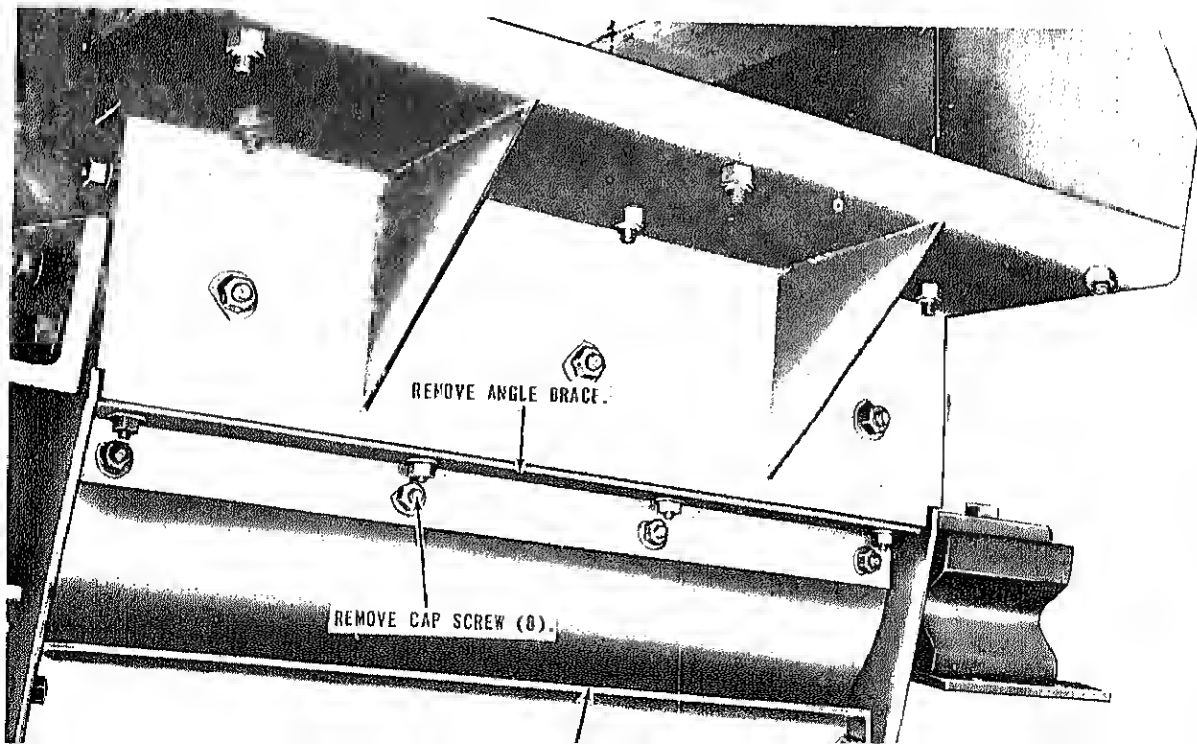
a. *Removal.*

- (1) Remove the scalper vibrating screen drive belt guard (TM 5-3820-10/2).
- (2) Remove the scalper vibrating screen assembly rubber mountings as instructed on figure 79.

b. *Cleaning and Inspection.* Clean and inspect all parts. Replace a damaged or defective part as necessary.

c. *Installation.*

- (1) Install the scalper vibrating screen assembly rubber mountings in reverse of instructions on figure 79.
- (2) Install the scalper vibrating screen drive belt guard (TM 5-3820-10/2).



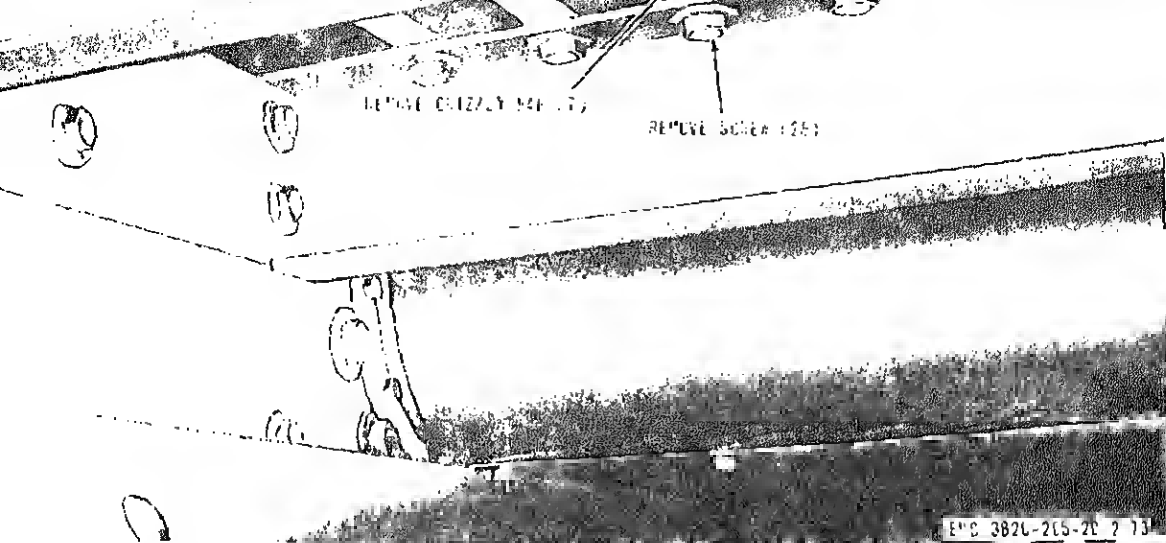
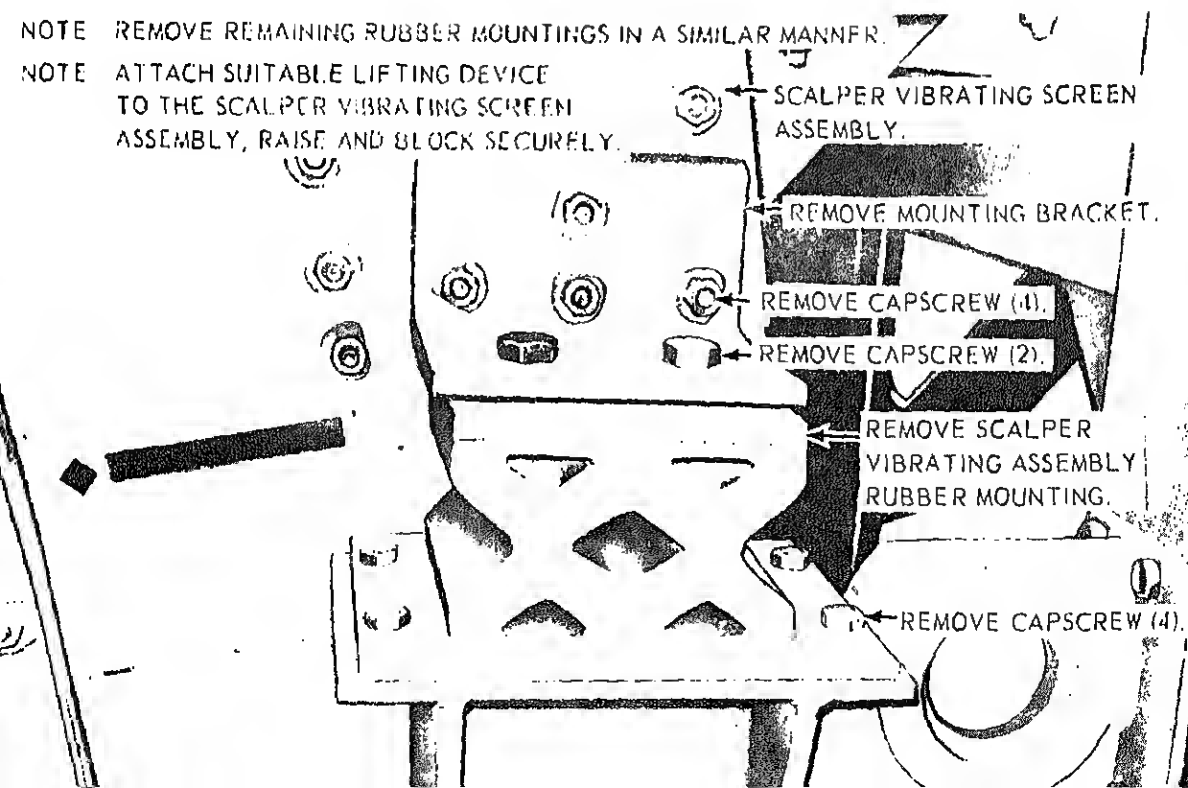


Figure 78. Grizzly bars, removal and installation.

NOTE REMOVE REMAINING RUBBER MOUNTINGS IN A SIMILAR MANNER.

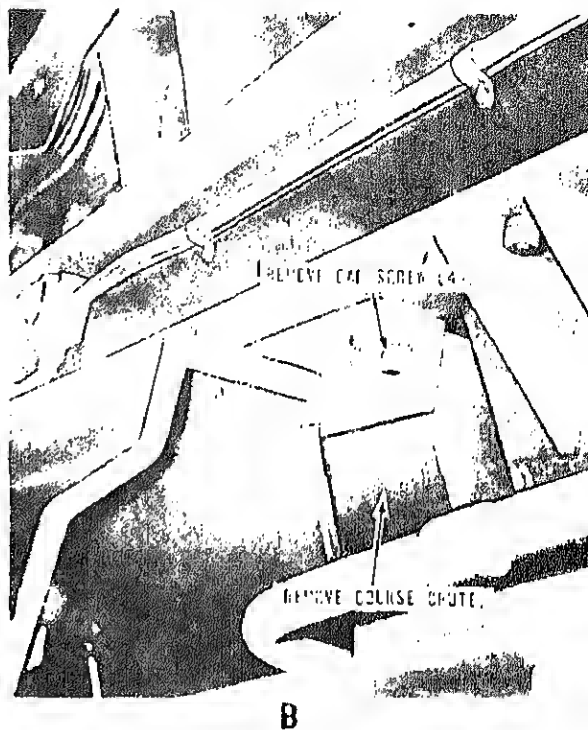
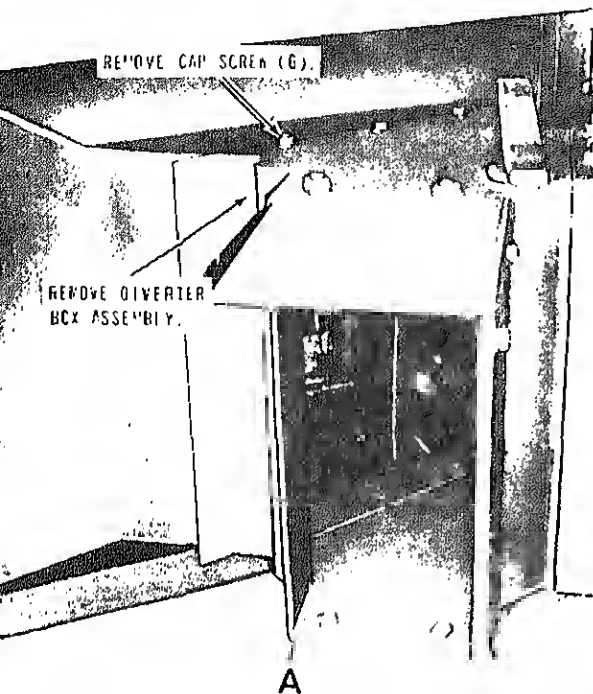
NOTE ATTACH SUITABLE LIFTING DEVICE TO THE SCALPER VIBRATING SCREEN ASSEMBLY, RAISE AND BLOCK SECURELY.



d. *Disassembly.* Disassemble the diverter box, chutes, and gate as illustrated on figure 81.

e. *Cleaning, Inspection, and Repair.* Clean

e. *Installation.* Install the diverter box and coarse chute in reverse of instructions on figure 80.

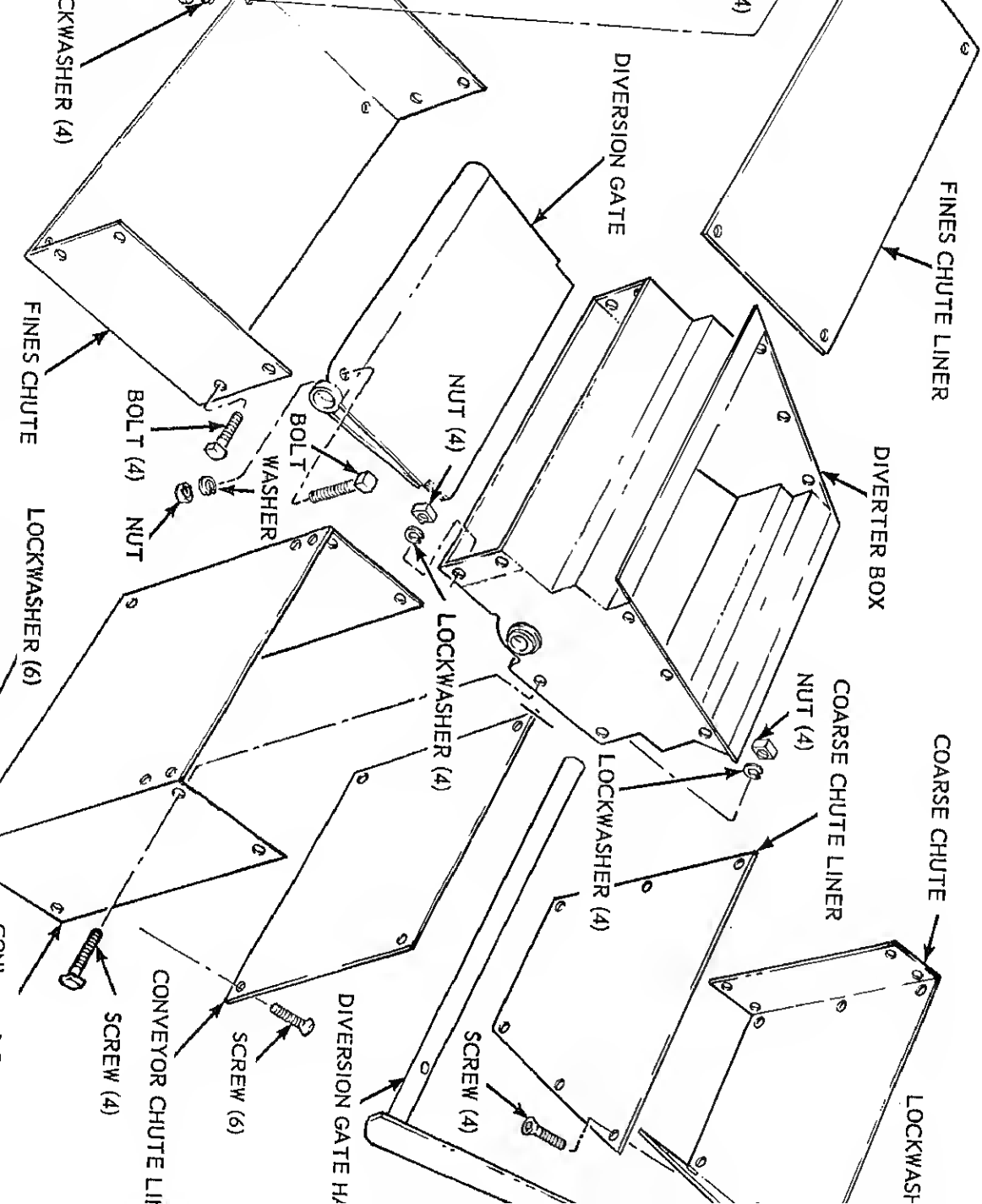


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A- Diverter box installed

B- Coarse chute installed

Figure 80. Diverter box and coarse chute, removal and installation.



153. General

The crusher assembly consists of a movable jaw and a stationary jaw made to crush aggregate any size from 1½ inches to 5 inches. The crusher is driven by belts from the diesel engine drive sheave to the crusher grooved balance wheel.

154. Drive Belt Guard Assembly

a. Removal. Remove the drive belt guard as instructed on figure 82.

b. Cleaning and Inspection. Clean and inspect all parts. Replace all damaged or defective parts.

c. Installation. Install the drive belt guard assembly in reverse of instructions on figure 82.

155. Drive Belts

a. Adjustment.

- (1) Remove the outer belt guard (par. 154).
- (2) Adjust the drive belt as instructed on figure 83.
- (3) Install the outer drive belt guard (par. 154).

b. Removal.

- (1) Remove the outer belt guard (par. 154).
- (2) Loosen drive belt tension as instructed on figure 83 and remove drive belts.

c. Cleaning and Inspection. Clean and inspect drive belts. Replace belts as a set if any are damaged or defective.

d. Installation.

- (1) Install the drive belts and adjust tension in reverse of instructions on figure 83.
- (2) Install the outer drive belt guard (par. 154).

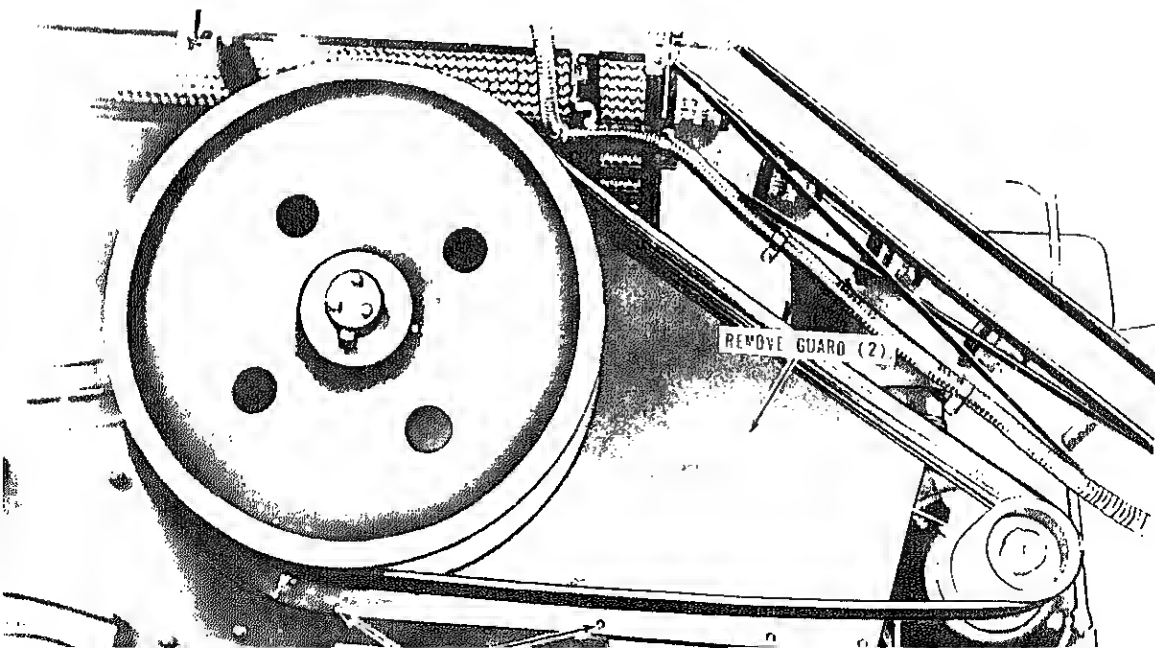
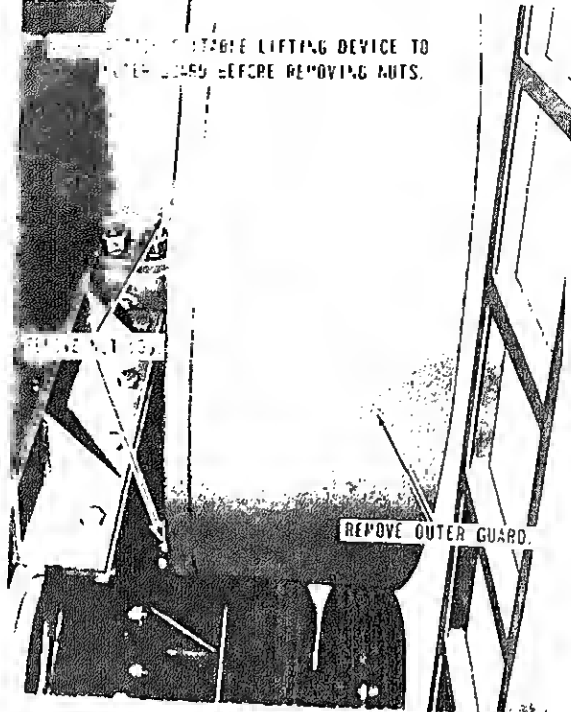
156. Tension Spring

a. Removal. Remove the tension spring as instructed on figure 84.

b. Cleaning and Inspection. Clean and inspect all parts. Replace all damaged parts.

c. Installation. Install the tension spring in reverse of instructions on figure 84.

d. Adjustment. For adjustment of tension spring, refer to TM 5-3820-205-1.



NOTE: LOOSEN ENGINE MOUNTING BOLT (4)
BEFORE TURNING ADJUSTING SCREWS.

ENGINE HOUSING

FRAME

ADJUSTMENT SCREW (2)

NOTE: TURN ADJUSTING SCREWS CLOCKWISE
TO LOOSEN BELTS AND COUNTERCLOCKWISE
TO TIGHTEN BELTS.

A

CRUSHER DRIVE SHEAVE

NOTE: ADJUST DRIVE BELTS TO A 1 IN.
DEFLECTION UNDER NORMAL THUMB
PRESSURE AT A POINT MIDWAY
BETWEEN THE SHEAVES.

DRIVE BELT (10)

ENGINE DRIVE SHEAVE

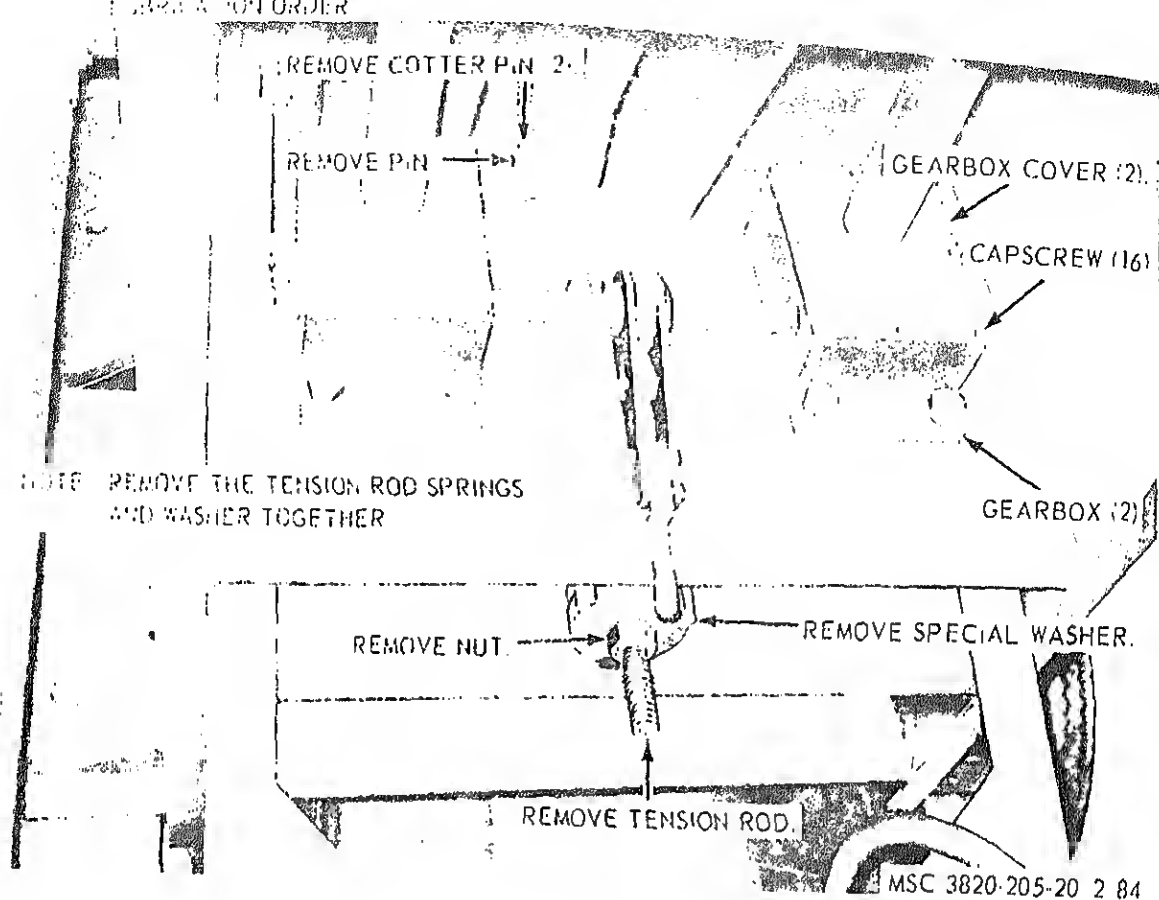


Figure 87. Tension spring and gear box covers, removal and installation.

Section VII. MAIN DISCHARGE CONVEYOR ASSEMBLY

157. General

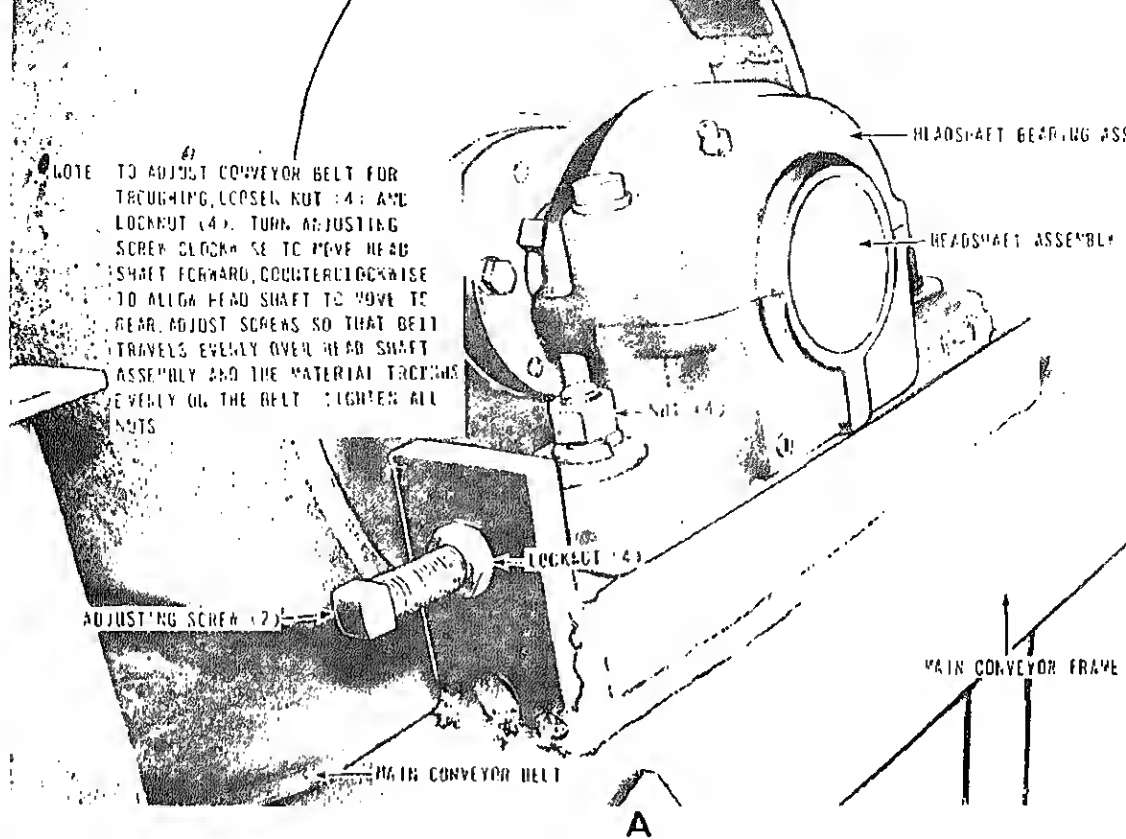
The main discharge conveyor assembly receives the crusher rock from the crusher jaws, and may receive the material from the diverter box for conveying out the rear of the jaw crusher. The main discharge conveyor consists of a conveyor belt, an electric motor, motor drive shafts, reducer gears, drive pulleys, head and tail crusher assemblies, impact troughing and return rollers, head and tail shaft assemblies, and conveyor frame.

159. Main Discharge Conveyor Drive Gear Reducer and Sheave Assembly

a. Removal.

- (1) Remove the main discharge conveyor drive belts (par. 129).
- (2) Remove the main discharge conveyor drive gear reducer and sheave assembly as instructed on figure 86.
- (3) Remove drive sheave from gear reducer as instructed on figure 86.

b. Cleaning and Inspection.



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A Main conveyor belt troughing adjustment

Figure 85. Main conveyor belt, adjustment.

- (2) Install drive gear reducer in reverse of instructions on figure 86.
- (3) Install the main discharge conveyor drive belts (par. 129).

160. Head Belt Scraper Assembly

a. *Removal.* Remove the head belt scraper assembly as instructed on figure 87.

b. *Disassembly.* Disassemble the head belt scraper as illustrated on figure 88.

c. *Cleaning, Inspection, and Repair.* Clean

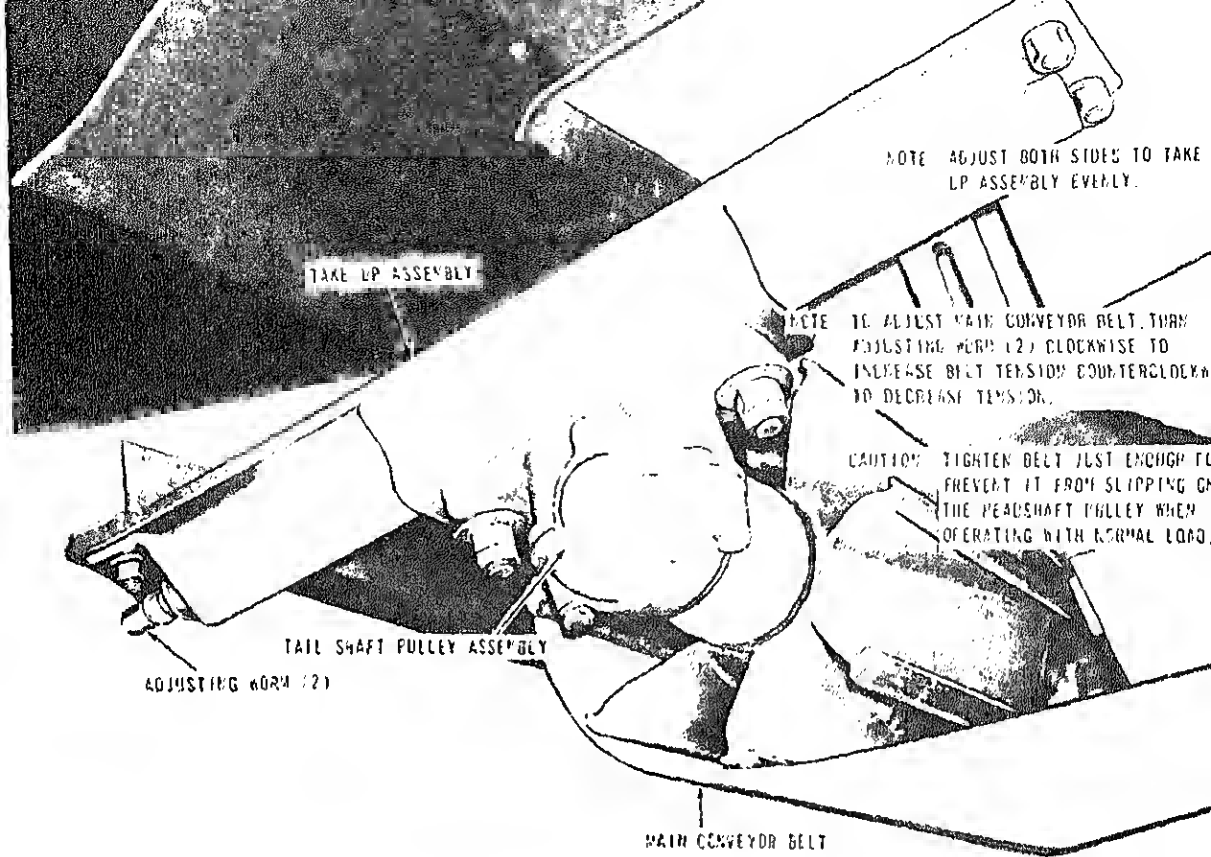
e. *Installation.* Install the head belt scraper assembly in reverse of instructions on figure 87.

161. Tail Scraper Assembly

a. *Removal.* Remove the tail scraper assembly as instructed on figure 89.

b. *Disassembly.* Disassemble the tail scraper assembly as illustrated on figure 90.

c. *Cleaning, Inspection, and Repair.* Clean and inspect all parts. Repair or replace ineffective or damaged part as required.



B

EMC 3026-265-20 2 86

B—Main conveyor belt tension adjustment

Figure 85—Continued.

162. Impact Roller Assemblies

a. Removal. Remove the impact roller assemblies as instructed on figure 91.

b. Disassembly. Disassemble the impact roller assemblies as illustrated on figure 92.

c. Cleaning, Inspection, and Repair. Clean and inspect all parts for damage or defects. Repair or replace as necessary.

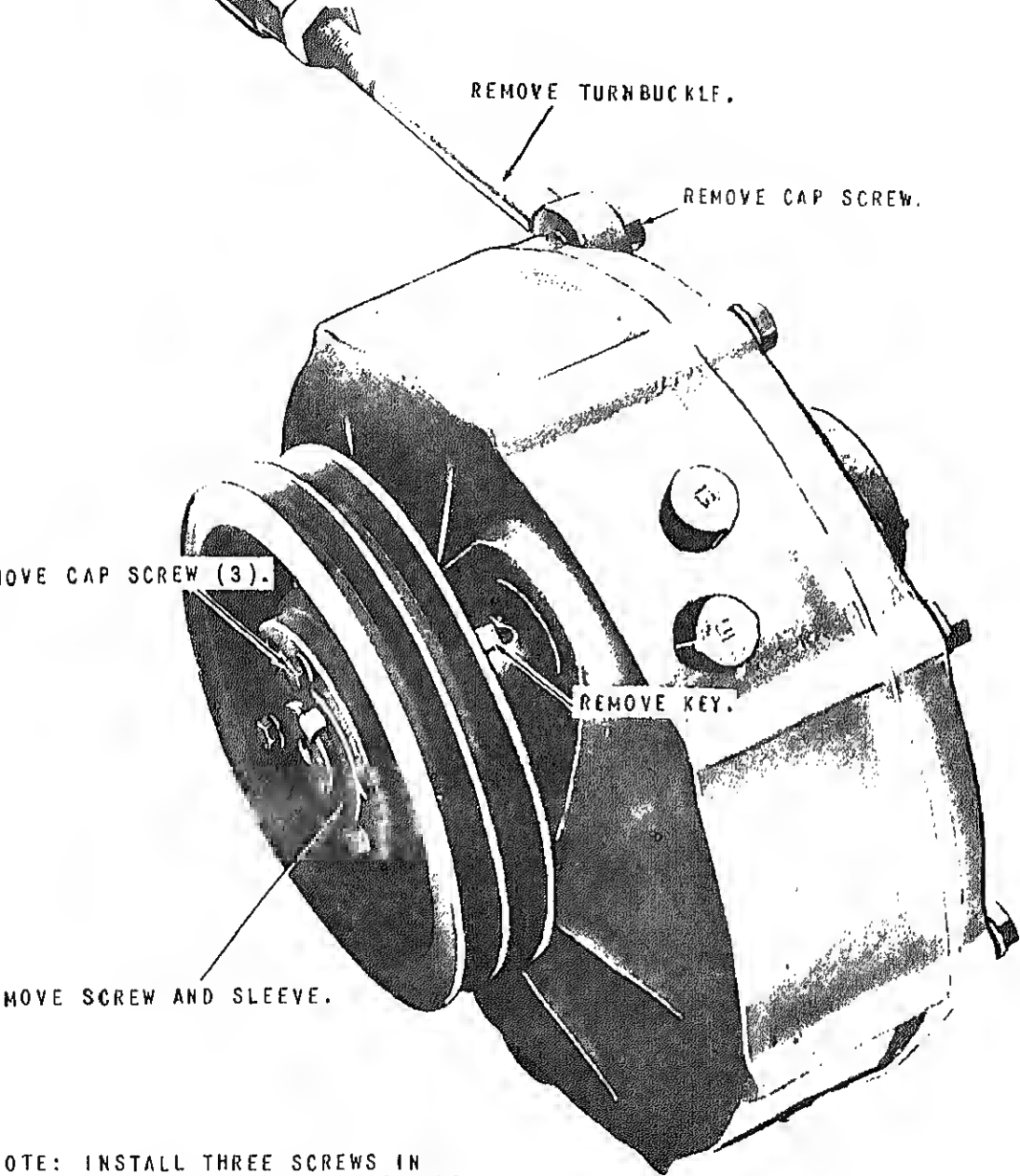
d. Reassembly. Reassemble the impact roller

b. Disassembly. Disassemble the troughing roller assemblies as illustrated on figure 92.

c. Cleaning, Inspection, and Repair. Clean and inspect all parts. Repair or replace defective or damaged parts as necessary.

d. Reassembly. Reassemble the troughing roller assemblies as illustrated on figure 92.

e. Installation. Install the troughing roller assemblies in reverse of instructions on



NOTE: INSTALL THREE SCREWS IN
THREADED HOLES; TURN SCREWS
IN TO REMOVE SHEAVE FROM
SHAFT.

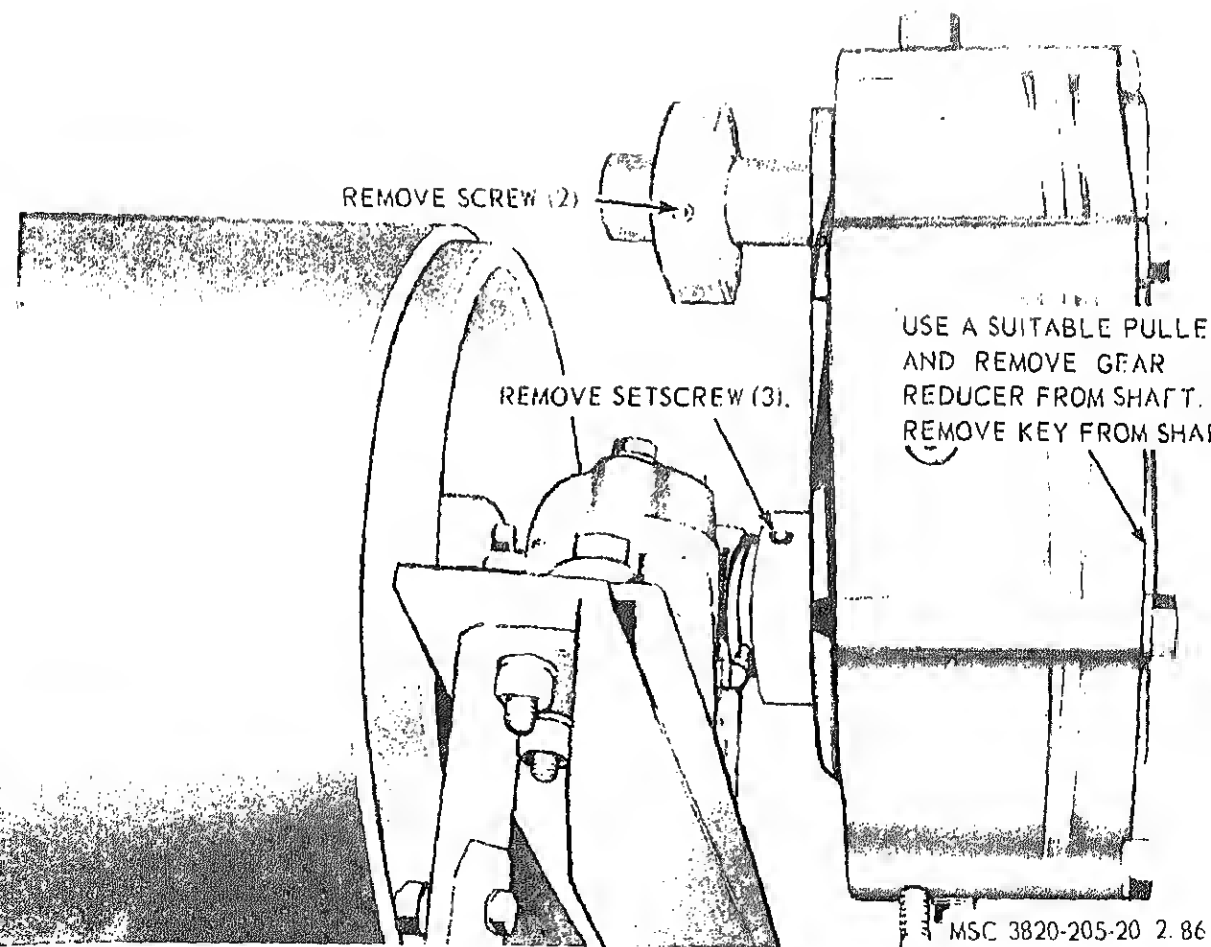
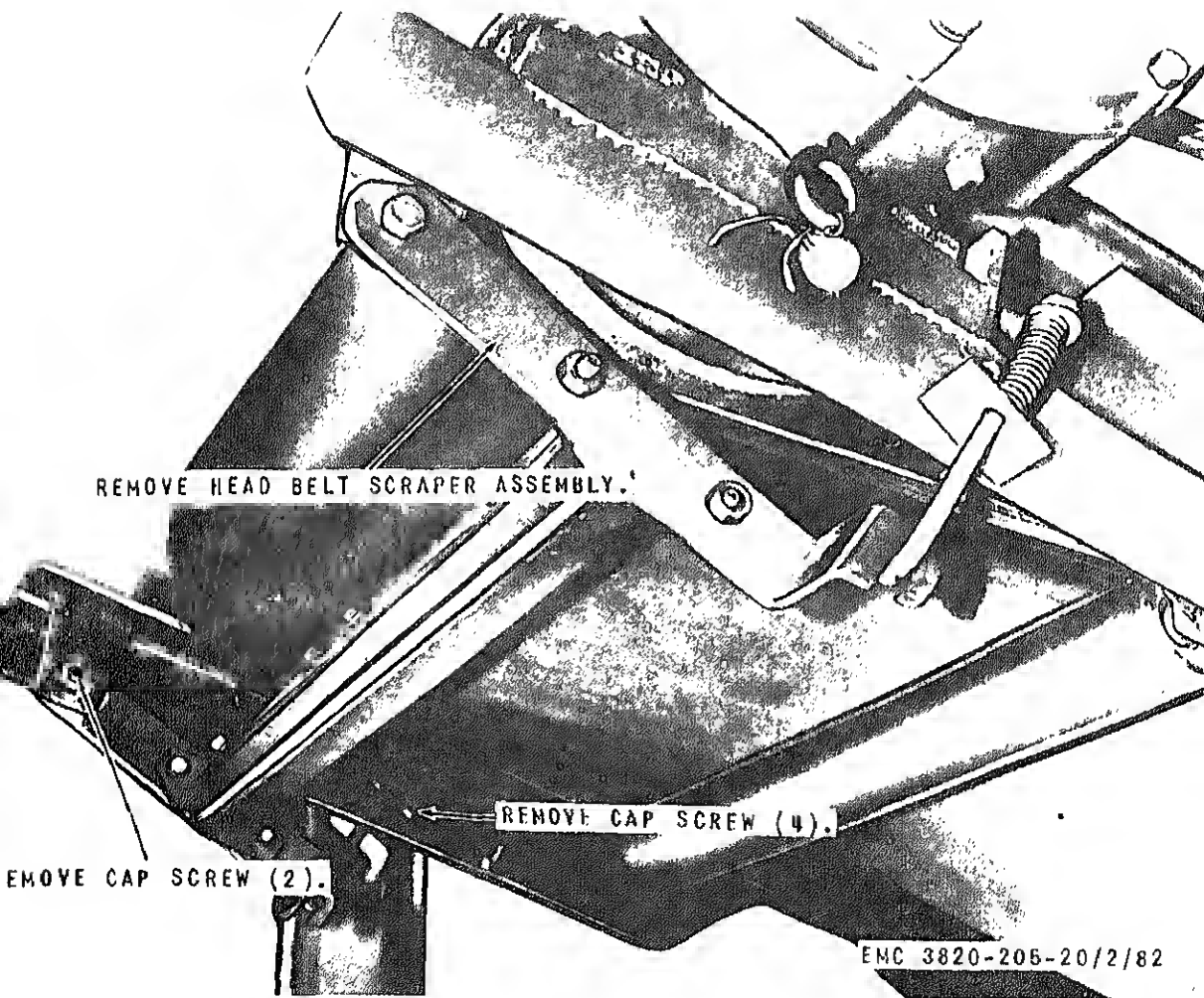
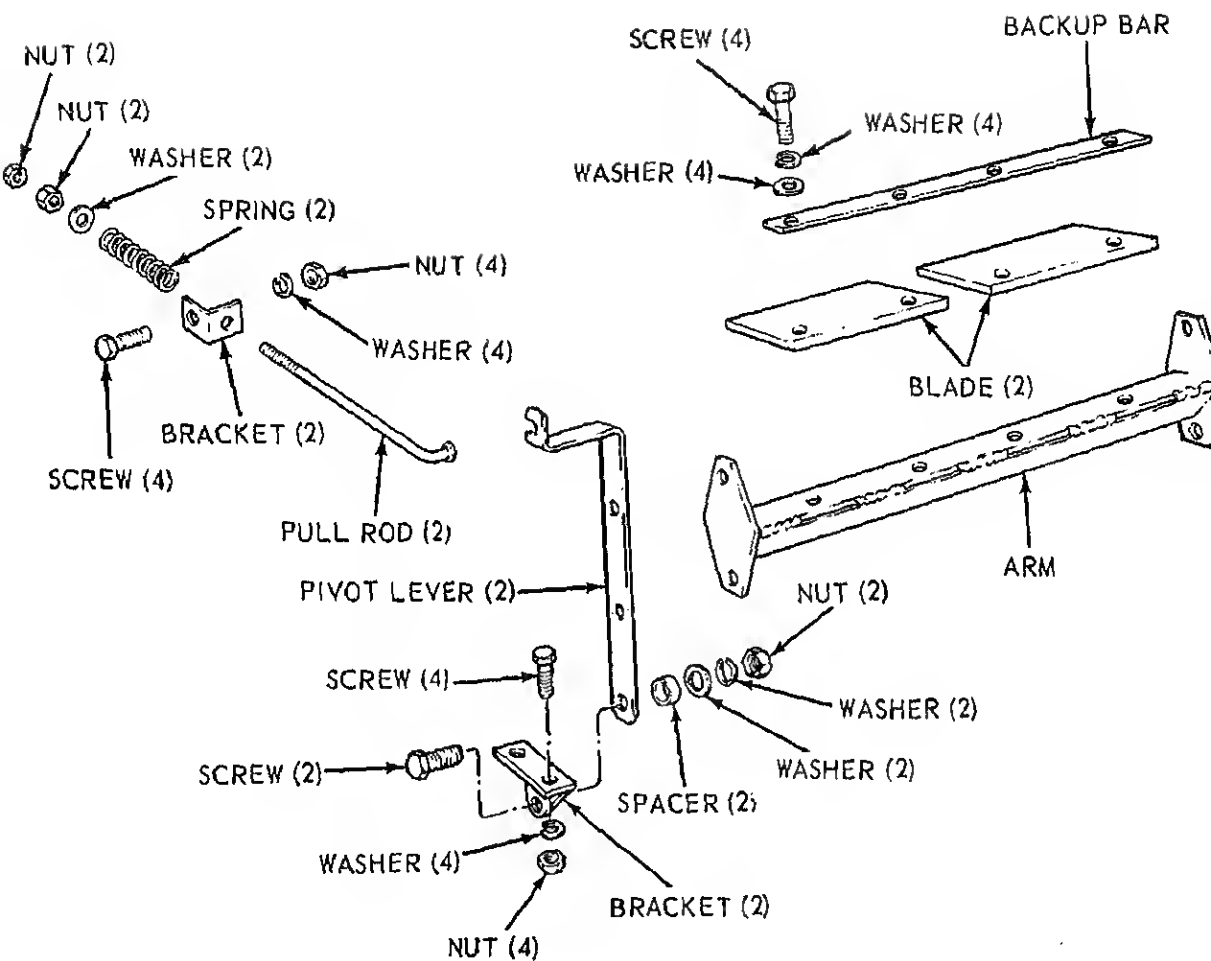


Figure 86—Continued.



EMC 3820-206-20/2/82

Figure 87. Head belt scraper assembly, removal and installation.



MSC 3820-205-20/2/

Figure 88. Head belt scraper assembly, exploded view.

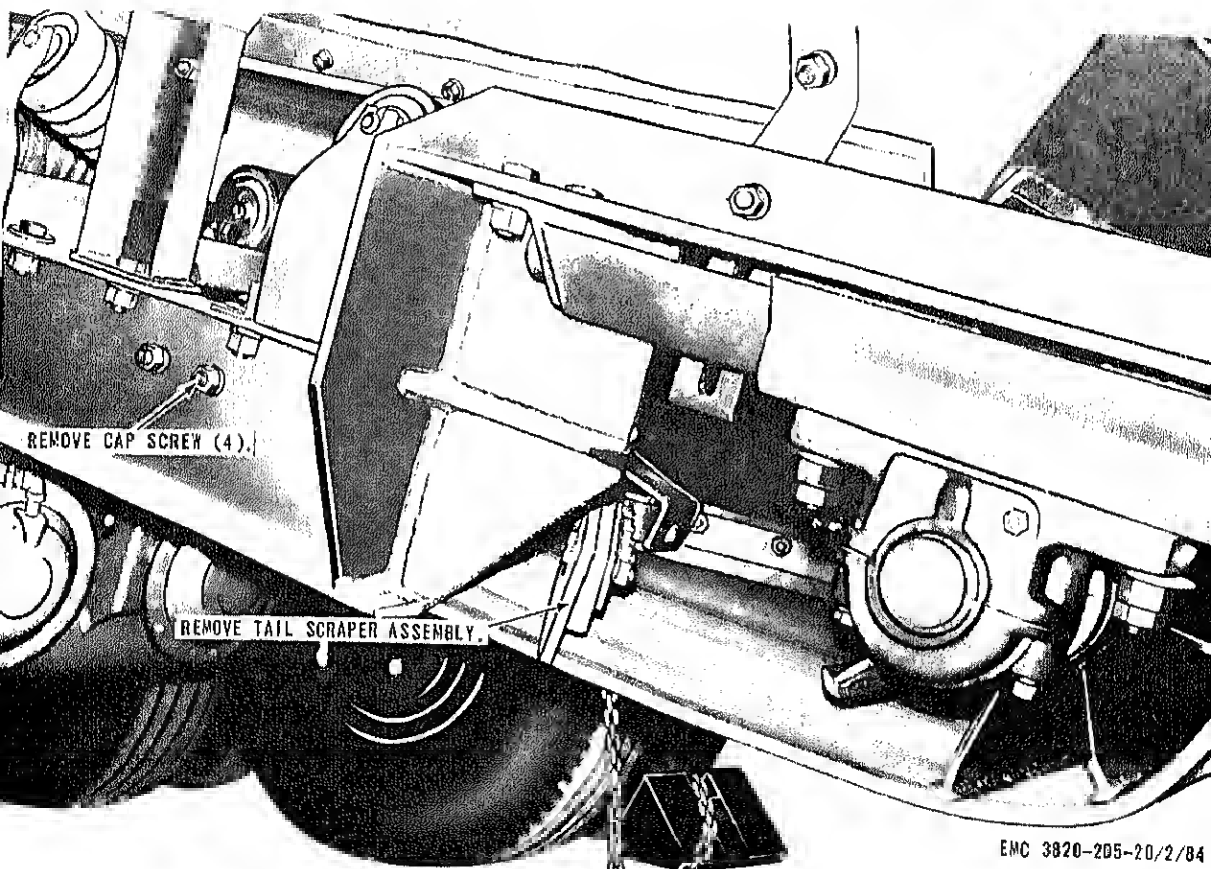
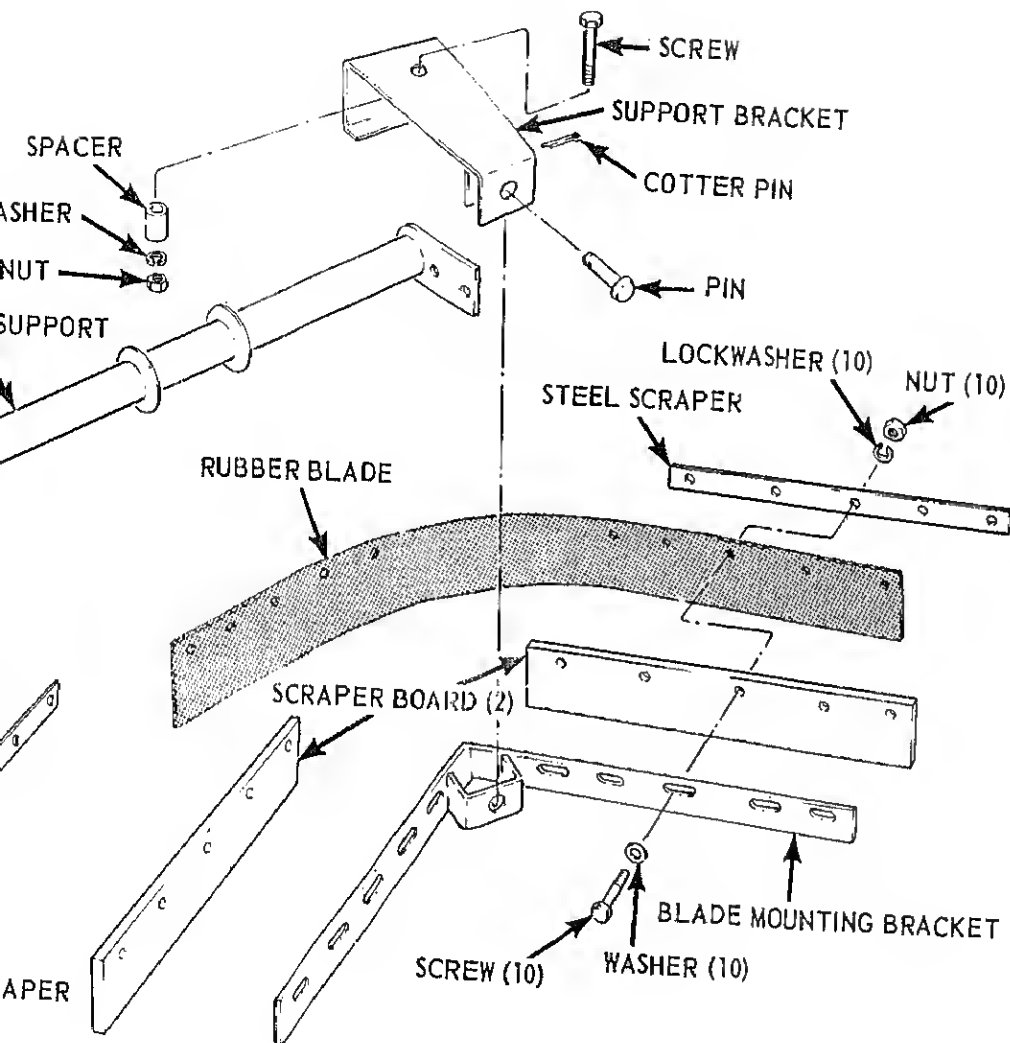


Figure 89. Tail scraper assembly, removal and installation.



MSC 3820-205-20/1/90

Figure 90. Tail scraper assembly, exploded view.

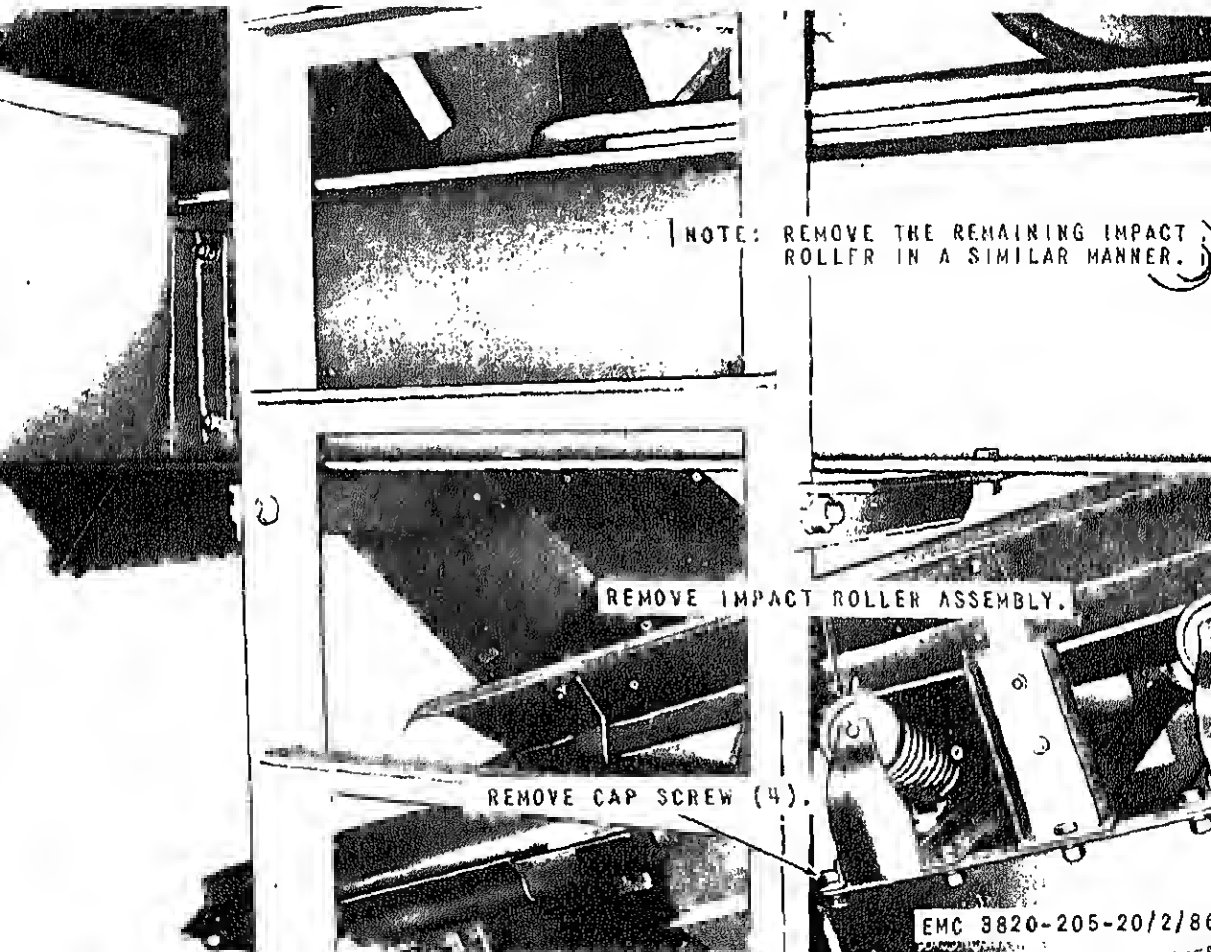


Figure 91. Impact roller assemblies, removal and installation.

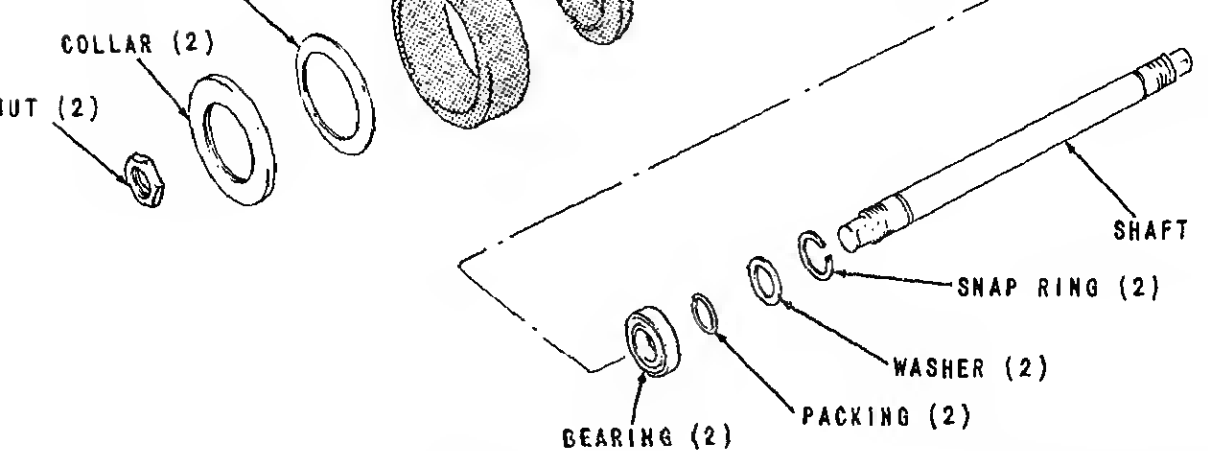
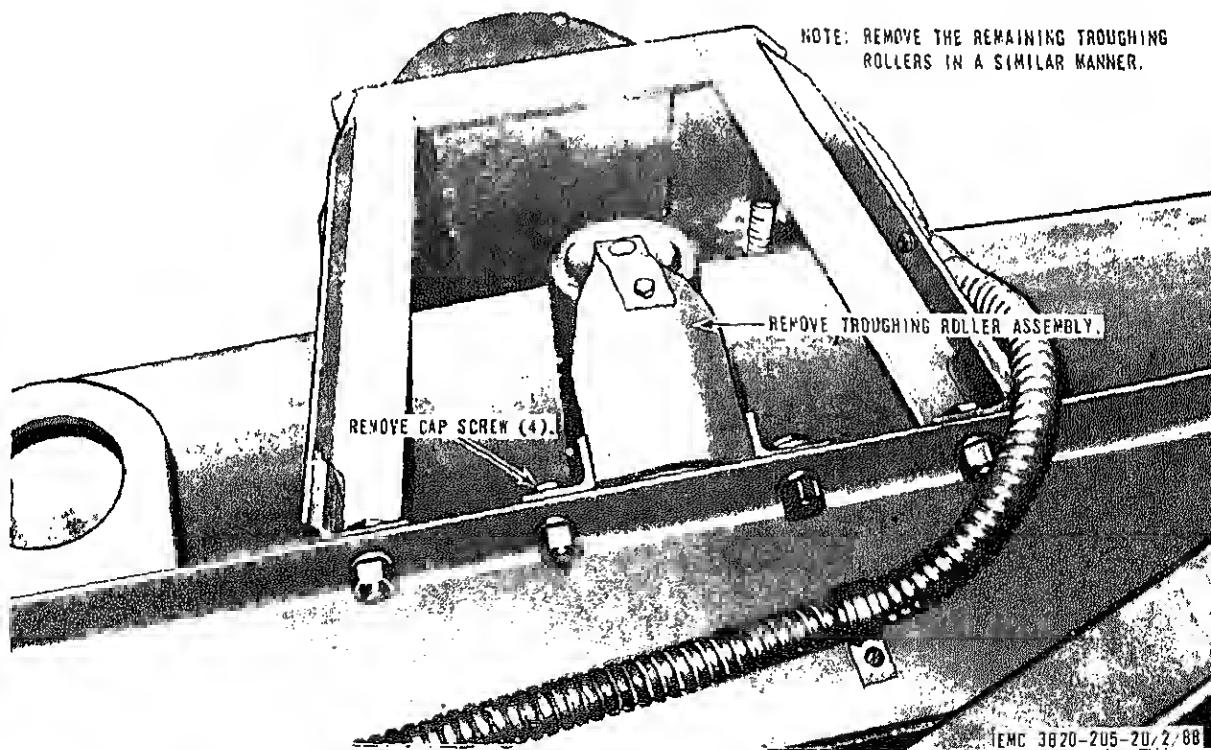
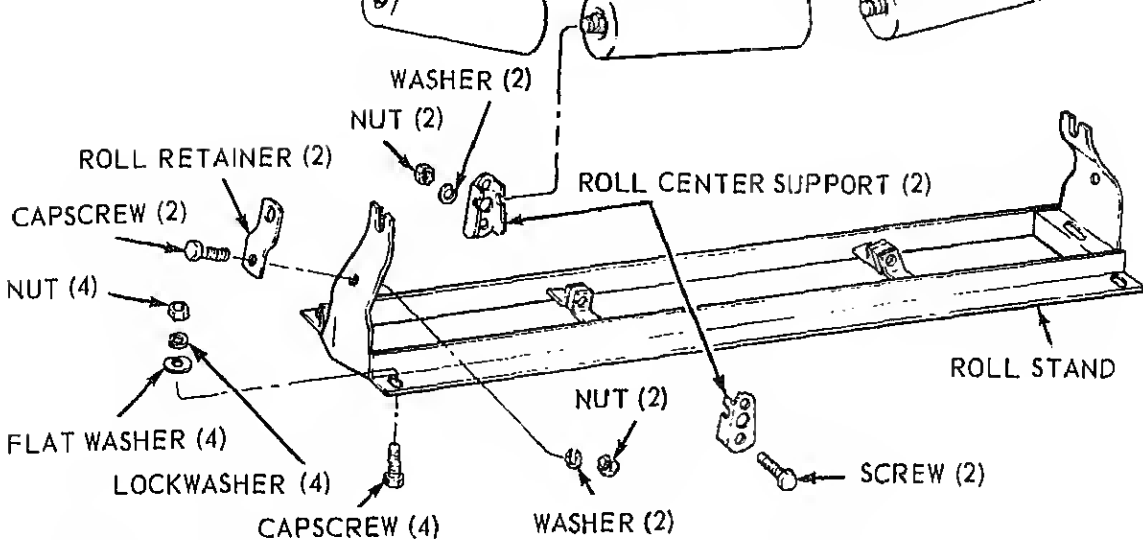


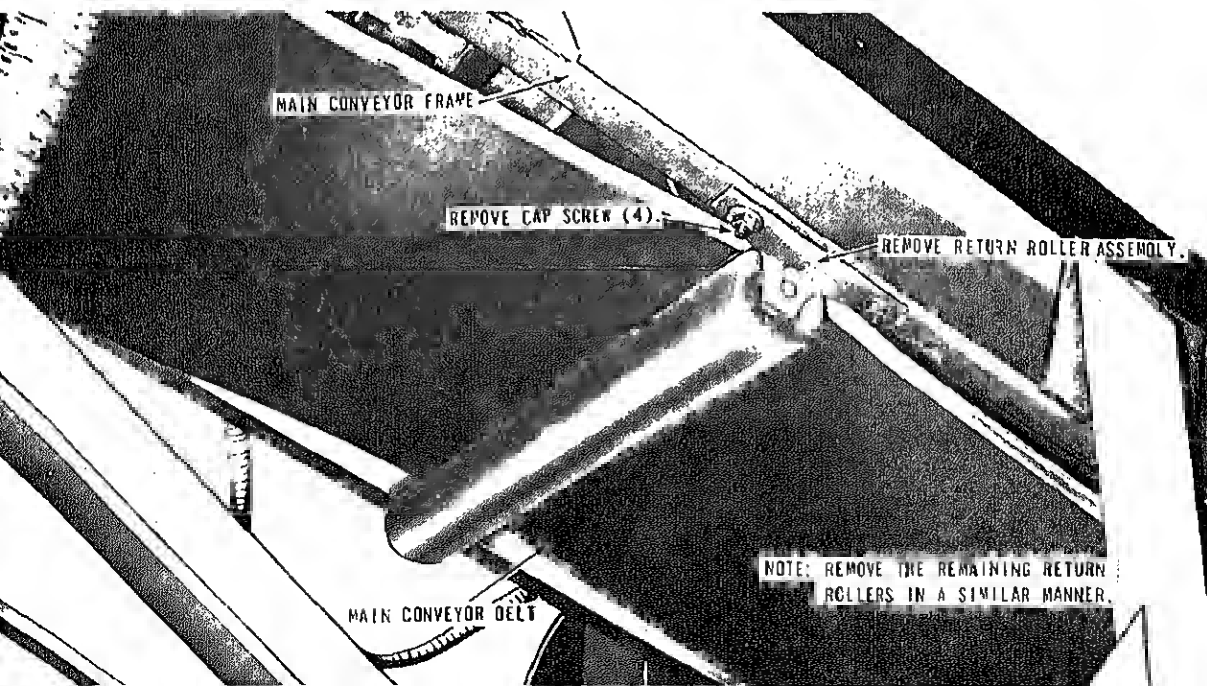
Figure 92. Impact roller assemblies, exploded view.

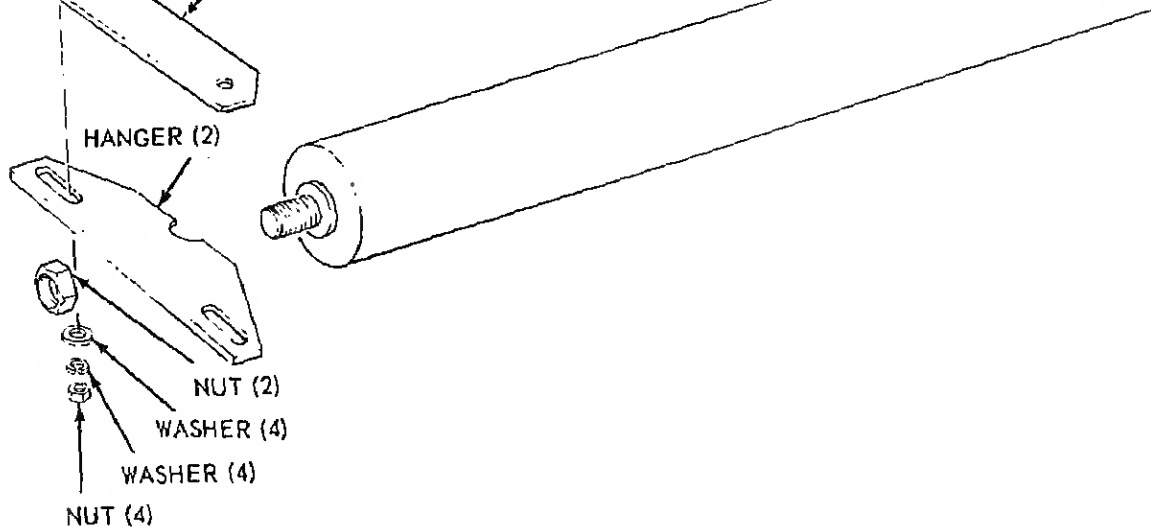




MSC 3820-205-20/2/94

Figure 94. Troughing roller assemblies, exploded view.





MSC 3820-205-2

Figure 96. Return roller assembly, exploded view.

c. *Cleaning, Inspection, and Repair.* Clean and inspect all parts. Repair or replace defective or damaged parts as necessary.

d. *Reassembly.* Reassemble the return roller assembly as illustrated on figure 96.

e. *Installation.* Install the return roller assembly in reverse of instructions on figure 95.

Section VIII. FRAME ASSEMBLY

165. General

The frame consists of the platforms, ladders, pintle hook and bracket, leveling jacks and supports, power cable and reel assembly, and toolbox.

166. Leveling Jacks and Supports

a. *Removal.* Remove the leveling jacks and supports as instructed on figure 97.

b. *Cleaning and Inspection.* Clean and inspect all parts. Replace all damaged or defective parts as necessary.

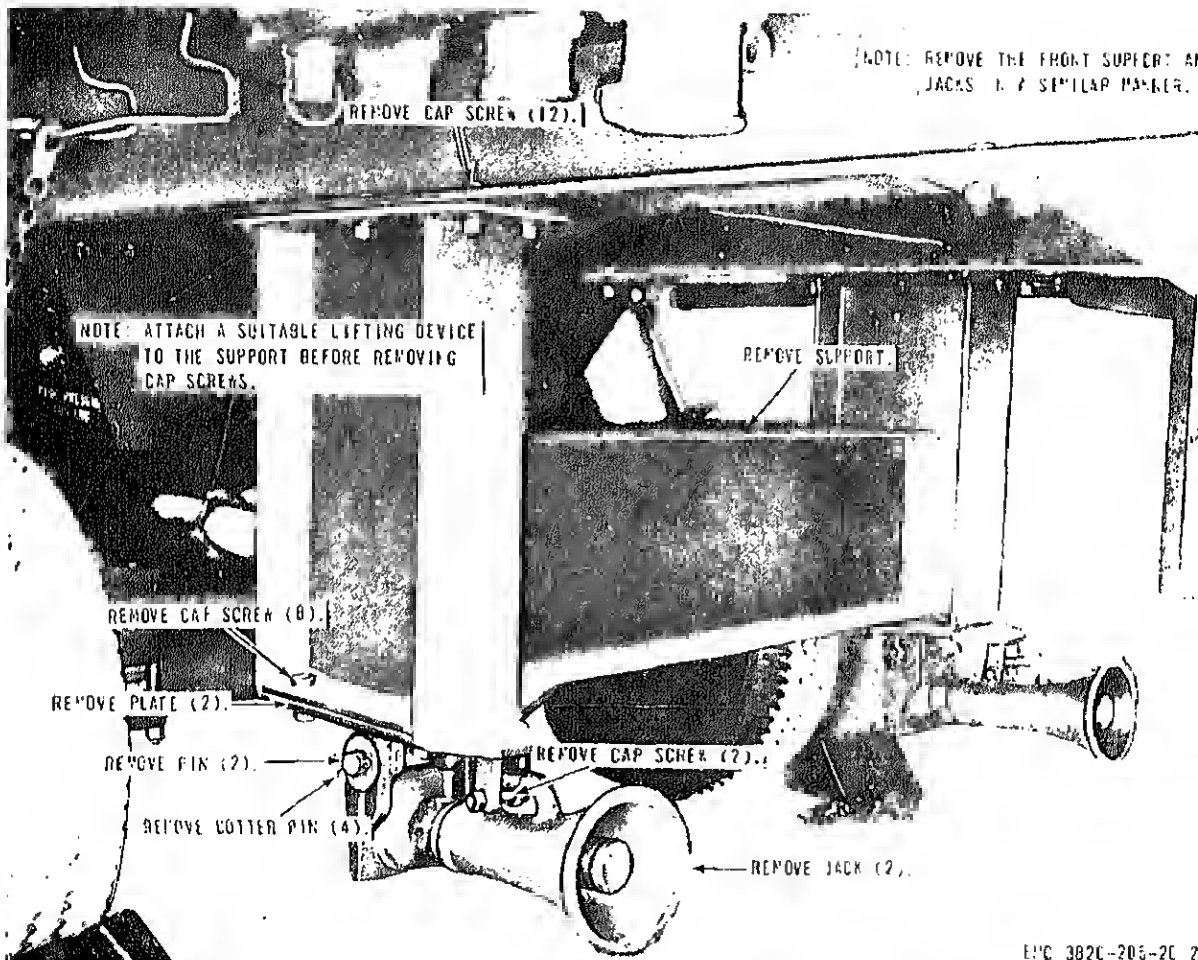
167. Pintle Hook and Bracket

a. *Removal.* Remove the pintle hook and bracket as instructed on figure 98.

b. *Disassembly.* Disassemble the pintle hook and bracket as illustrated on figure 99.

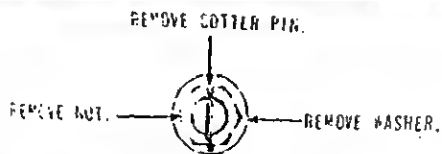
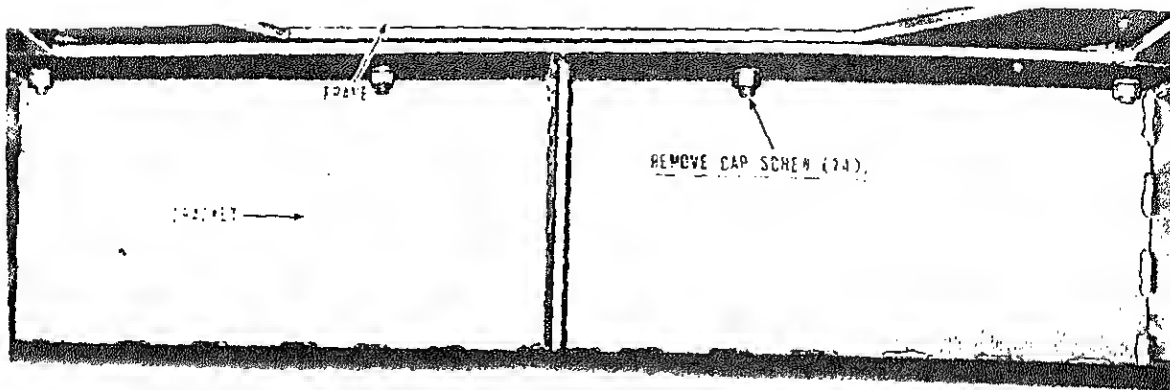
c. *Cleaning, Inspection, and Repair.* Clean and inspect all parts. Replace or repair damaged or defective parts as necessary.

d. *Reassembly.* Reassemble the pintle hook and bracket as illustrated on figure 100.

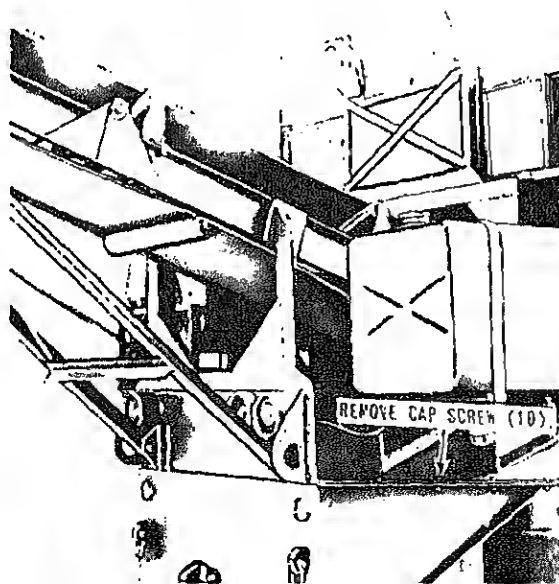


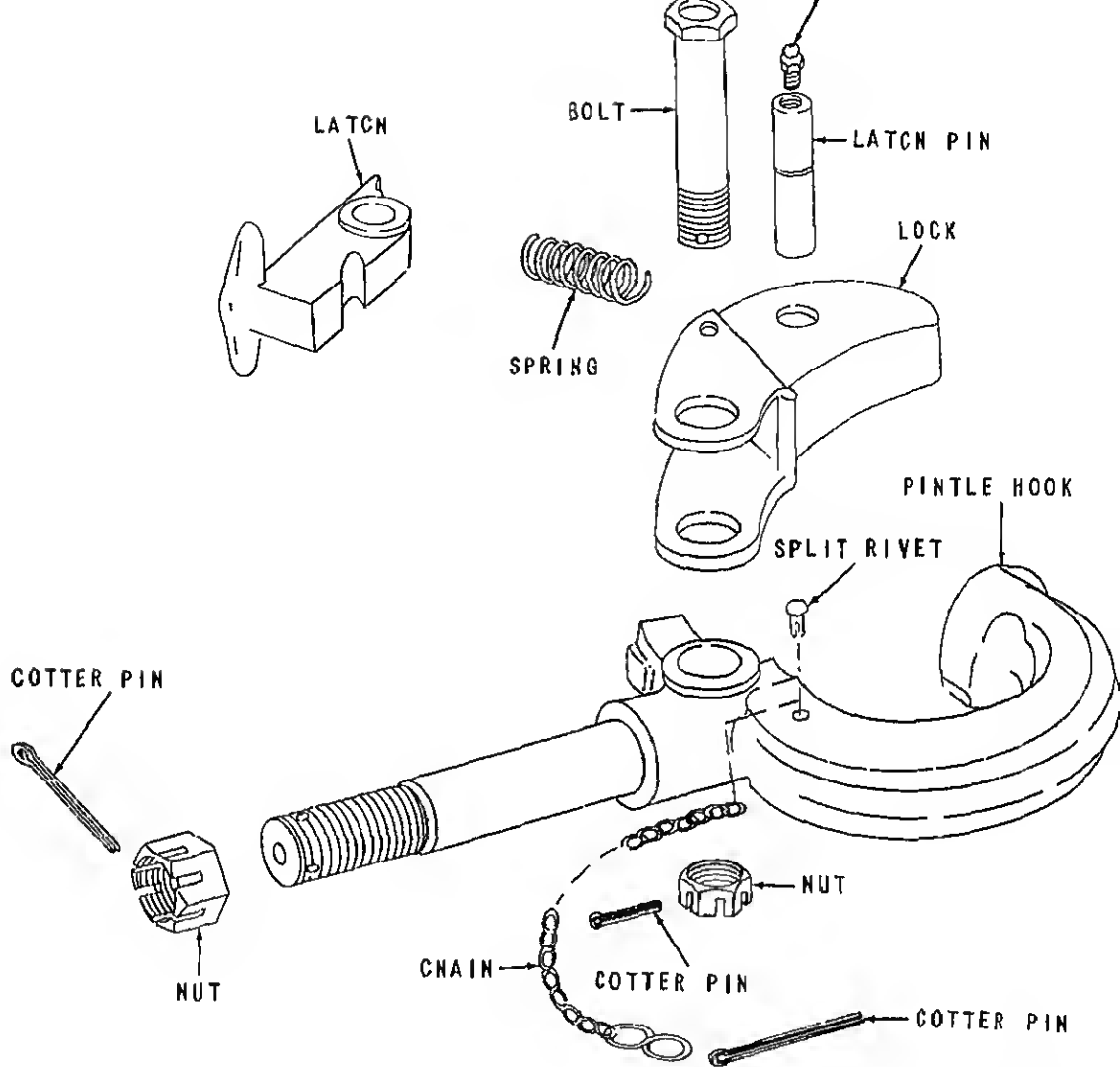
ENC 382C-205-2C 2

Figure 97. Leveling jacks and support, removal and installation.



A





EMC 3820-205-20/2

Figure 99. Pintle hook, exploded view.

168. Toolbox

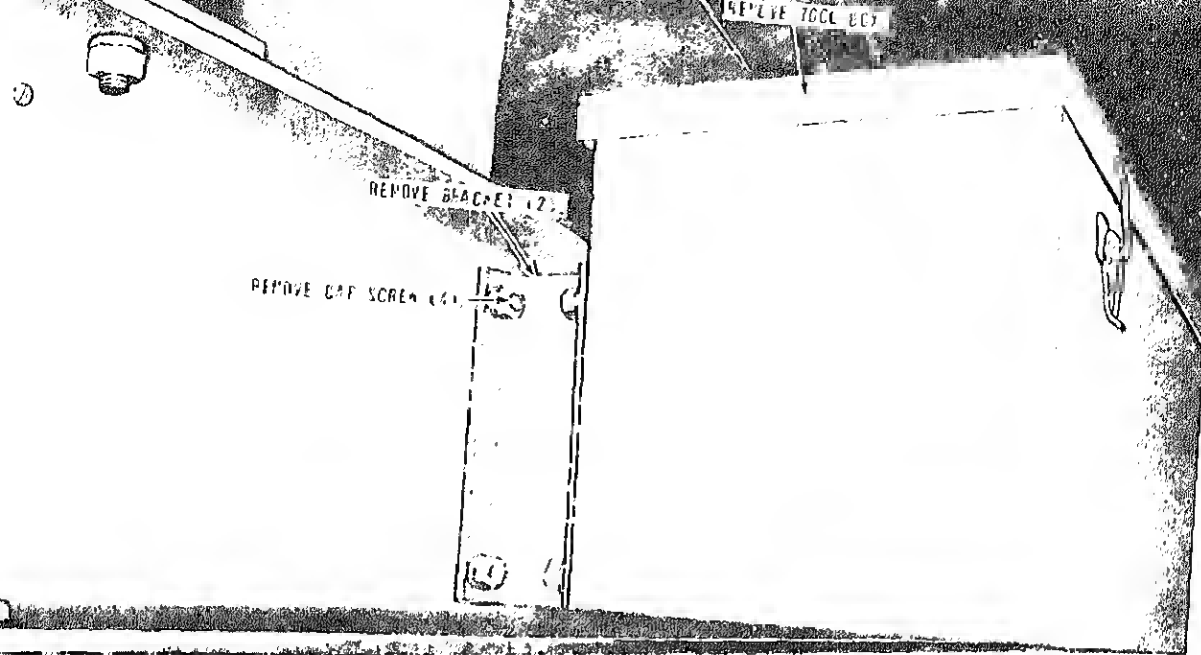
a. Removal. Remove the toolbox as instructed on figure 100.

b. Cleaning and Inspection. Clean and in-

169. Power Cable Reel Assembly

a. Removal.

(1) Remove clearance lights from power cable reel mounting



EPD 3820-215-76 7 95

Figure 100. Toolbox, removal and installation.

- (3) Remove the power cable reel assembly as instructed on figure 101.

Disassembly. Disassemble the power cable assembly as illustrated on figure 102.

Cleaning, Inspection, and Repair. Clean inspect all parts. Repair or replace all aged or defective parts.

Reassembly. Reassemble the power cable assembly as illustrated on figure 102.

Installation.

- 1) Install the power cable reel assembly in reverse of instructions on figure 101.

- 2) Install the electrical conduit on the power cable reel mounting bracket (par. 125).

power cable reel mounting bracket (par. 125).

170. Ladders and Platforms

a. Removal.

- (1) Disconnect the electric power supply (TM 5-3820-205-10 2) before removing the ladders or platforms.
- (2) Remove the ladders and platforms as instructed on figure 103.

b. Cleaning and Inspection. Clean and inspect all parts. Replace all damaged or defective parts.

c. Installation.

- (1) Install the platforms and ladders in reverse of instructions on figure 103.

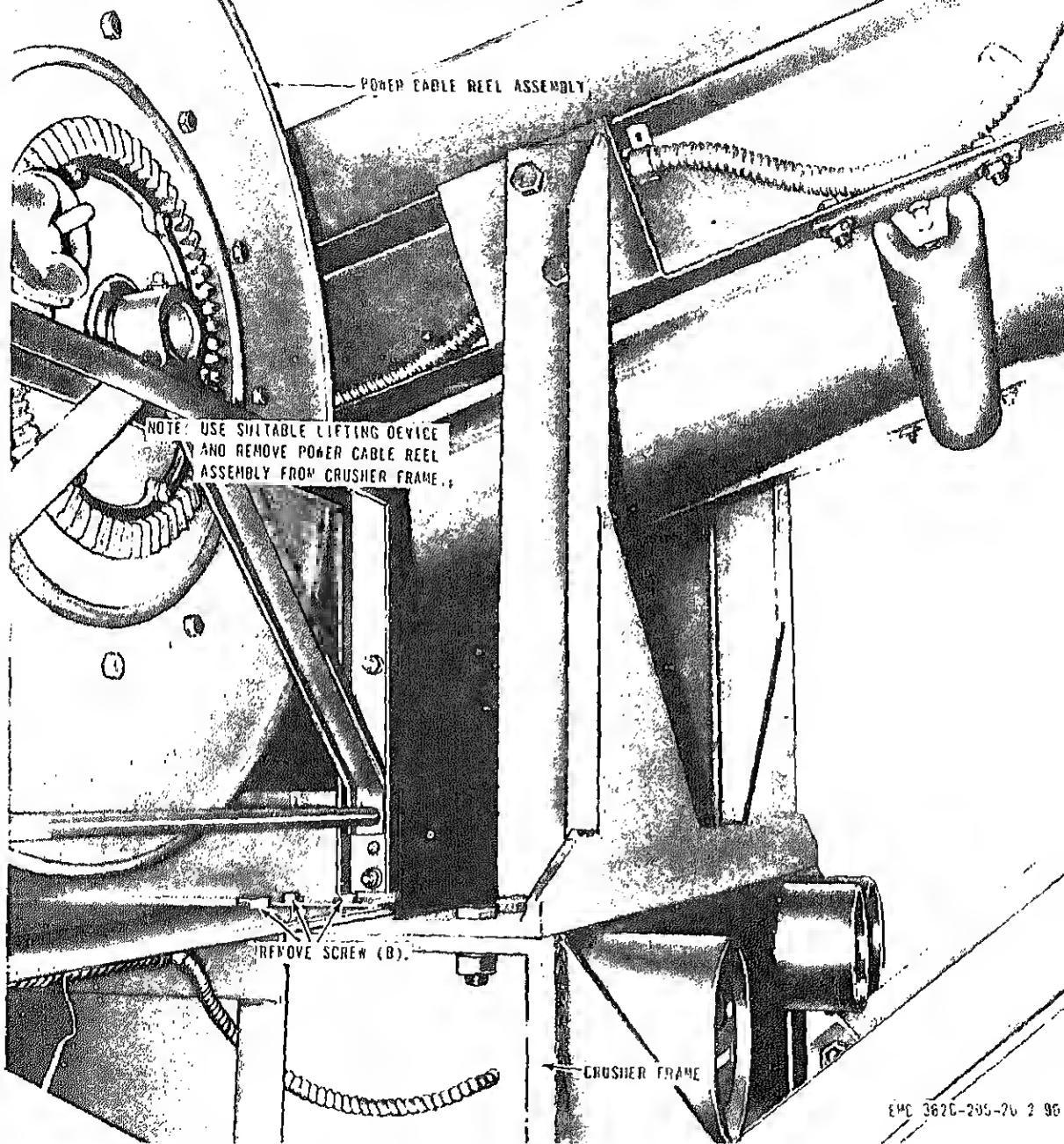


Figure 101. Power cable reel assembly, removal and installation.

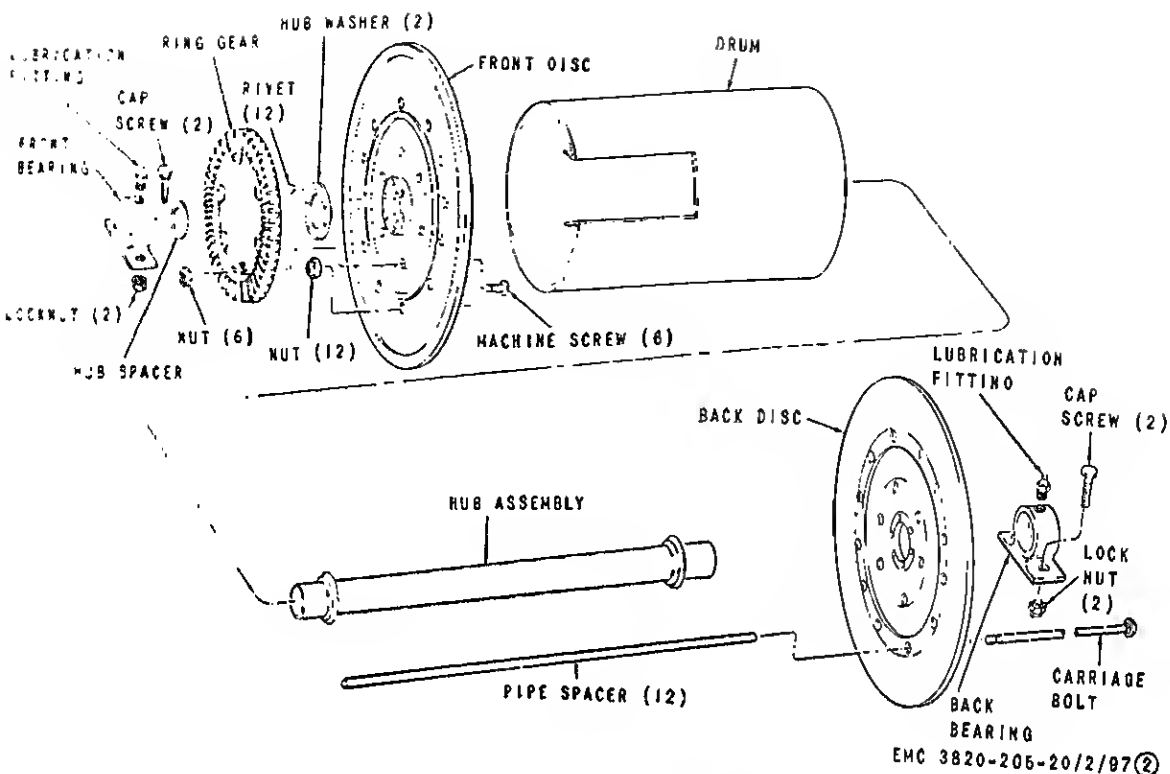
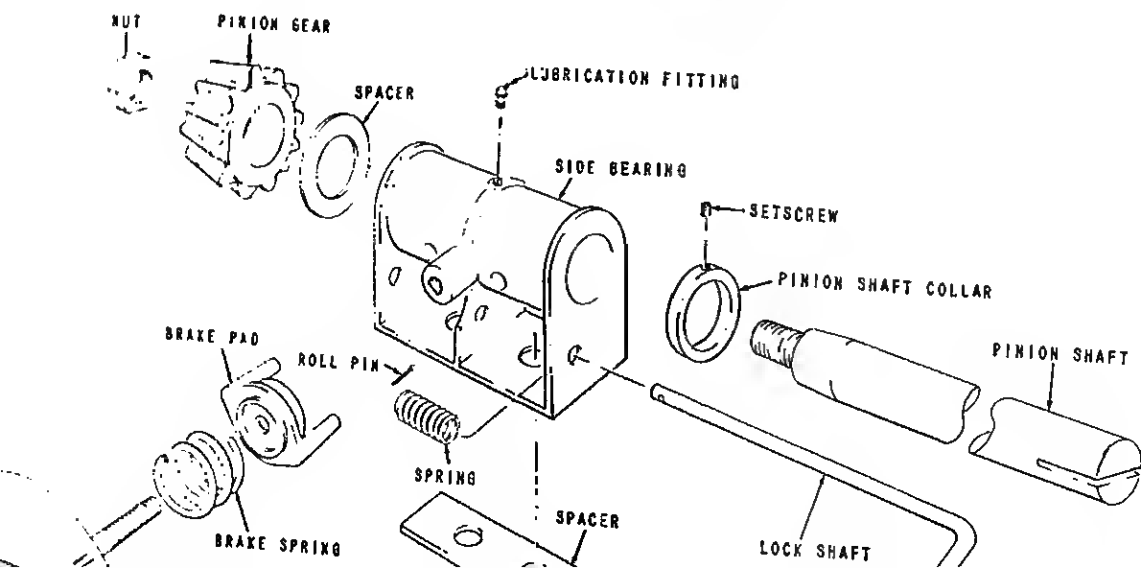
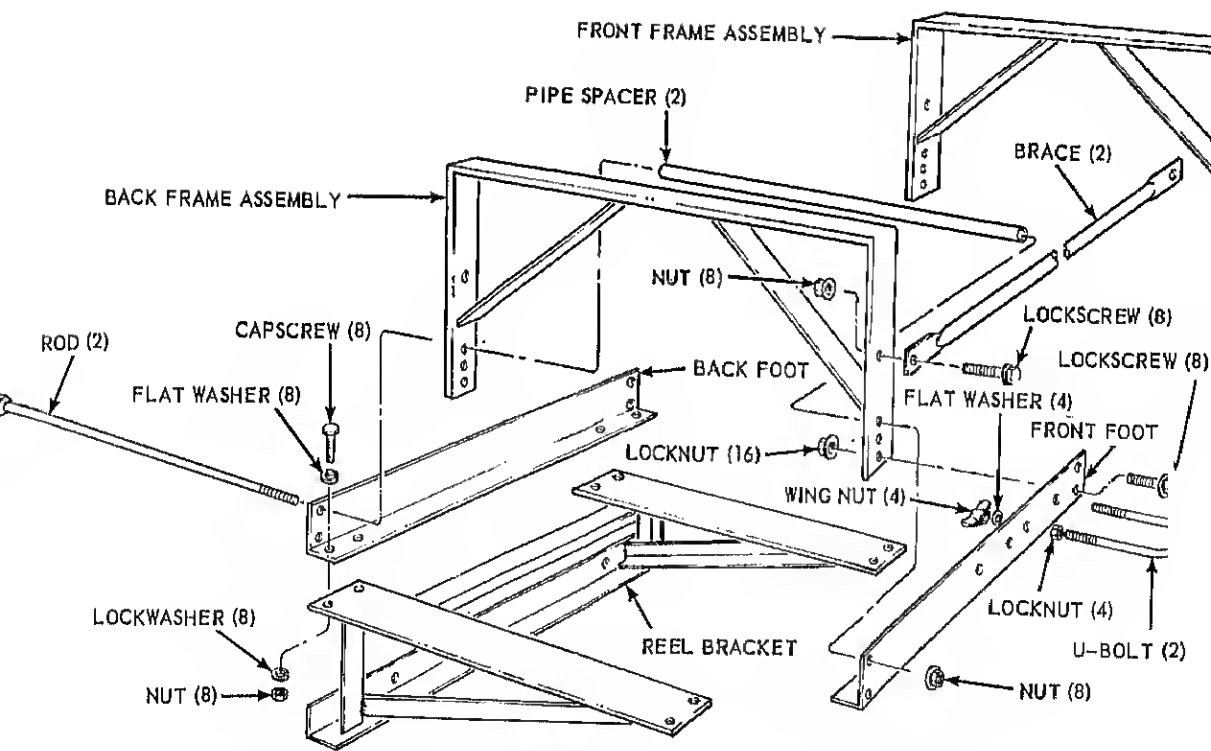
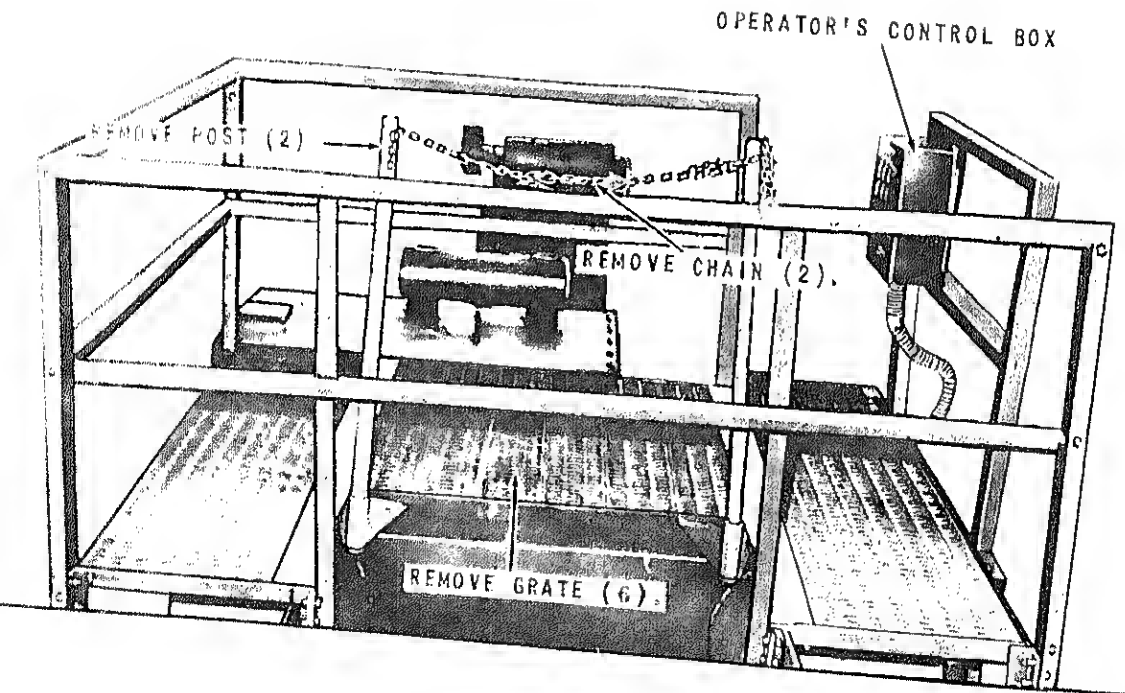


Figure 162. Power cable reel assembly, exploded view.





NOTE: REMOVE OPERATOR'S CONTROL
BOX FROM THE RAILING.



A

EMC 3820-205-20/2/98①

A—Upper platform grates and guard rails installed view
Figure 103. Ladders and platforms, removal and installation.

REMOVE FLOOR GRATE (2).

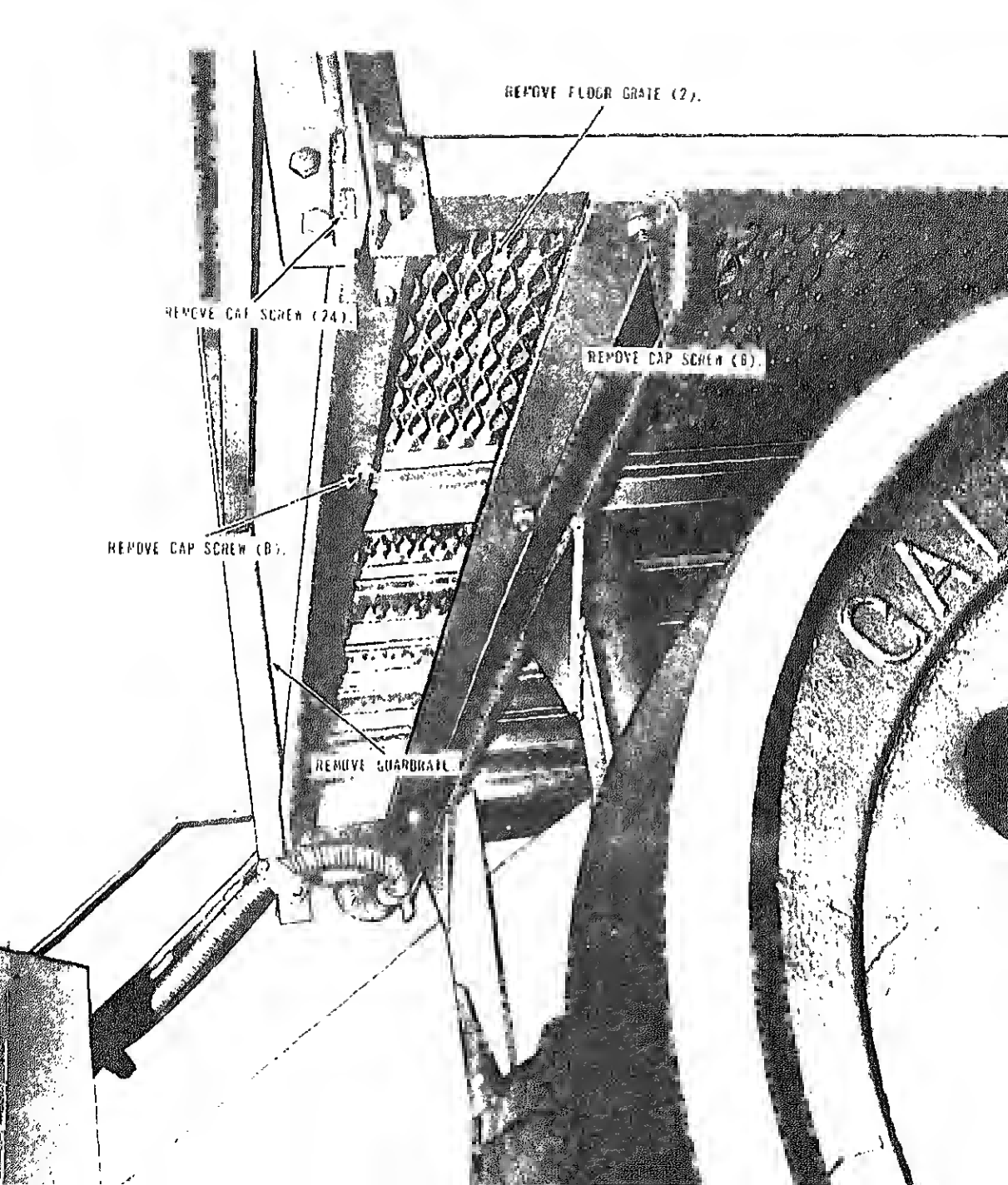
REMOVE CAP SCREW (24).

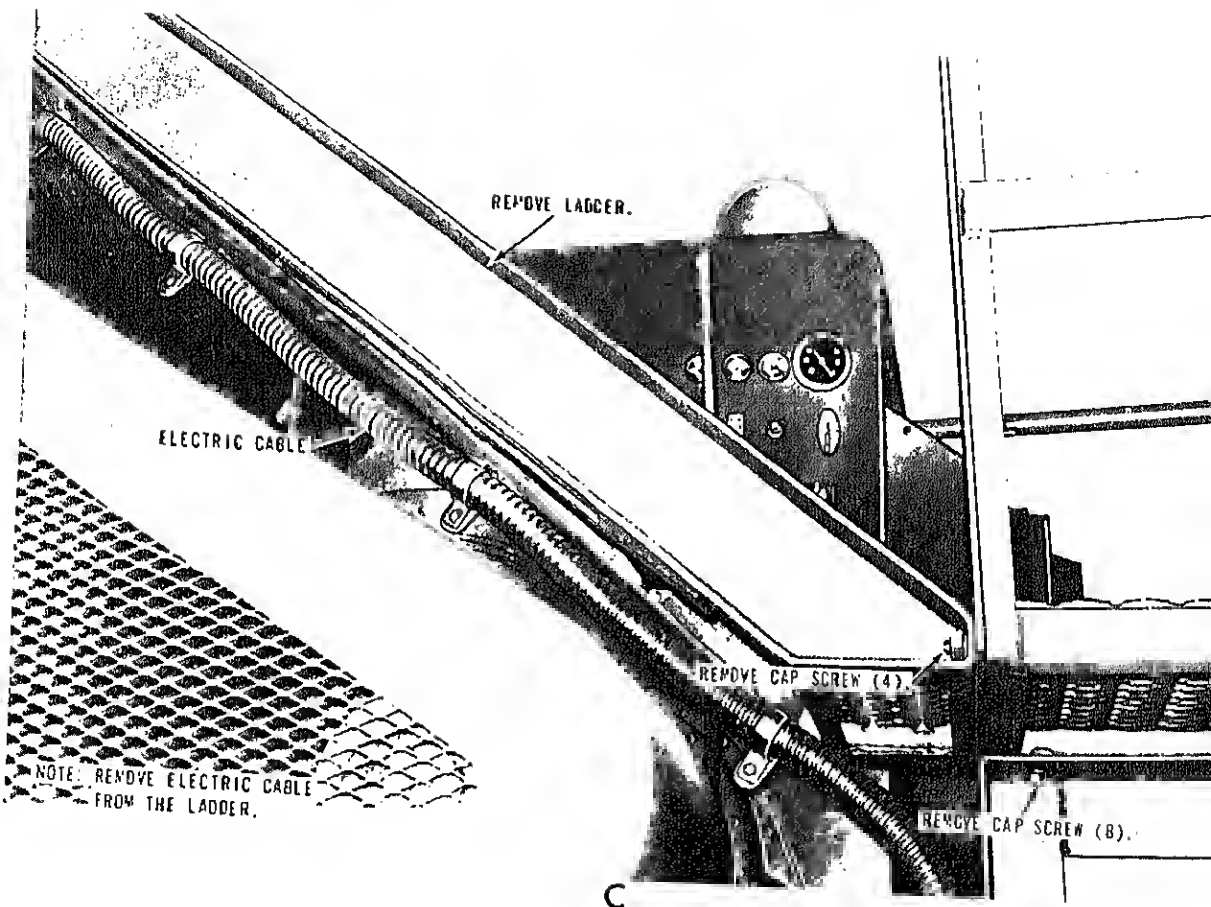
REMOVE CAP SCREW (8).

REMOVE CAP SCREW (8).

REMOVE GUARDRAIL.

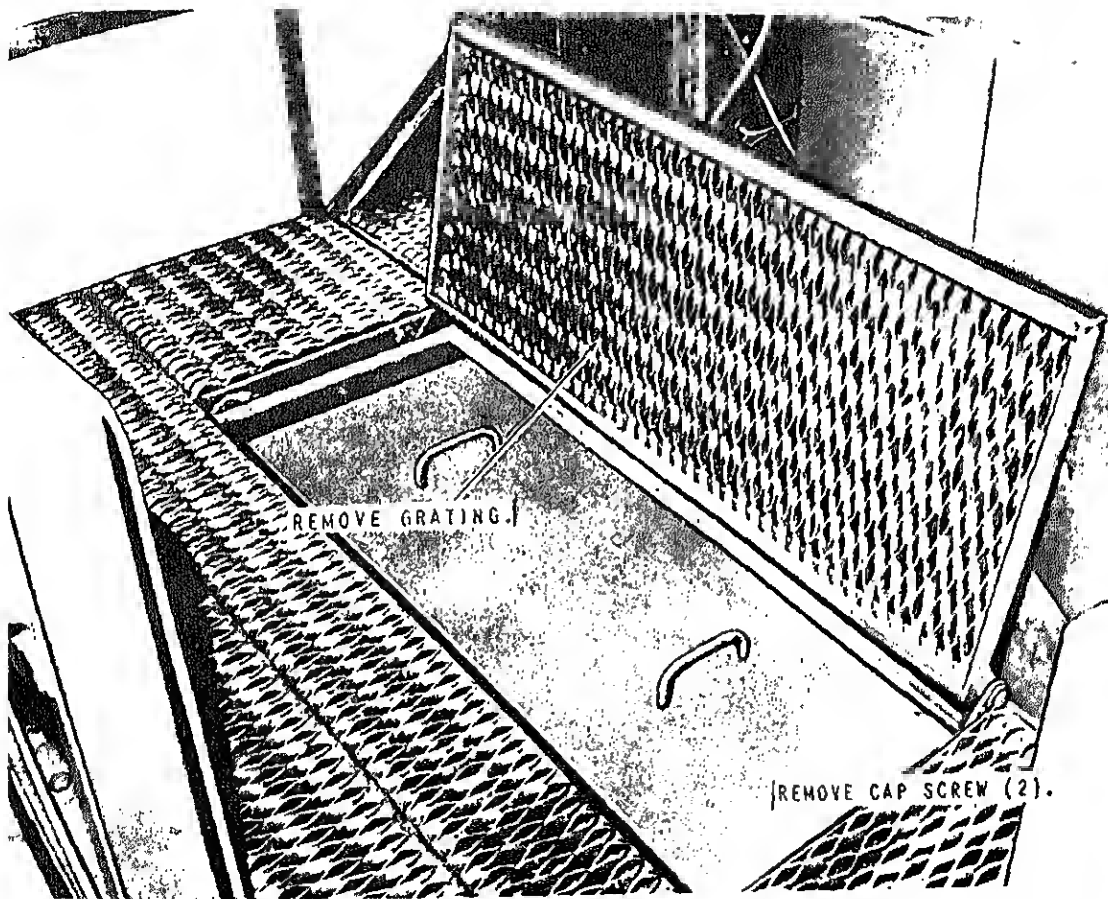
CAUTION





EMC 3820-205-20 2 96 (3)

C—Intermediate ladder installed view
Figure 103—Continued.



REMOVE GRATING.

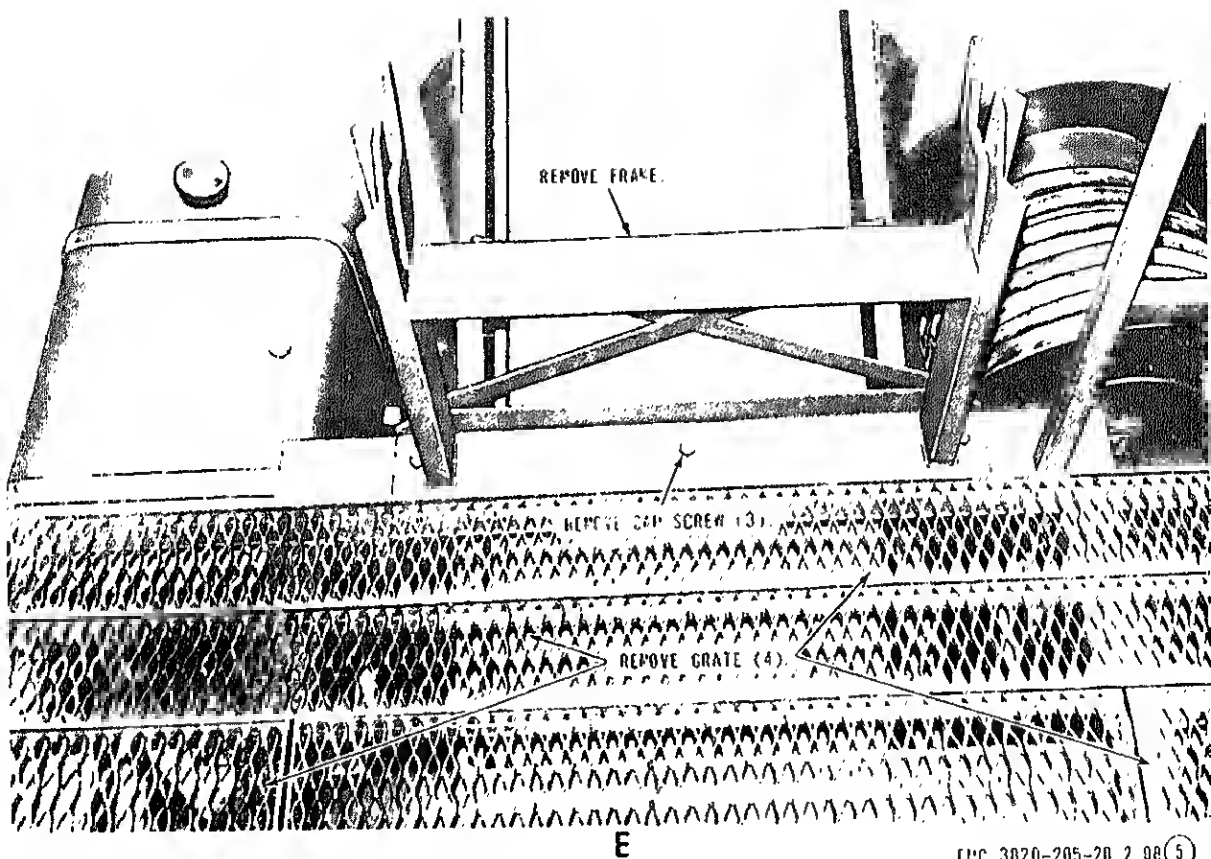
REMOVE CAP SCREW (2).

D

EMC 3820-205-20/2/98 ④

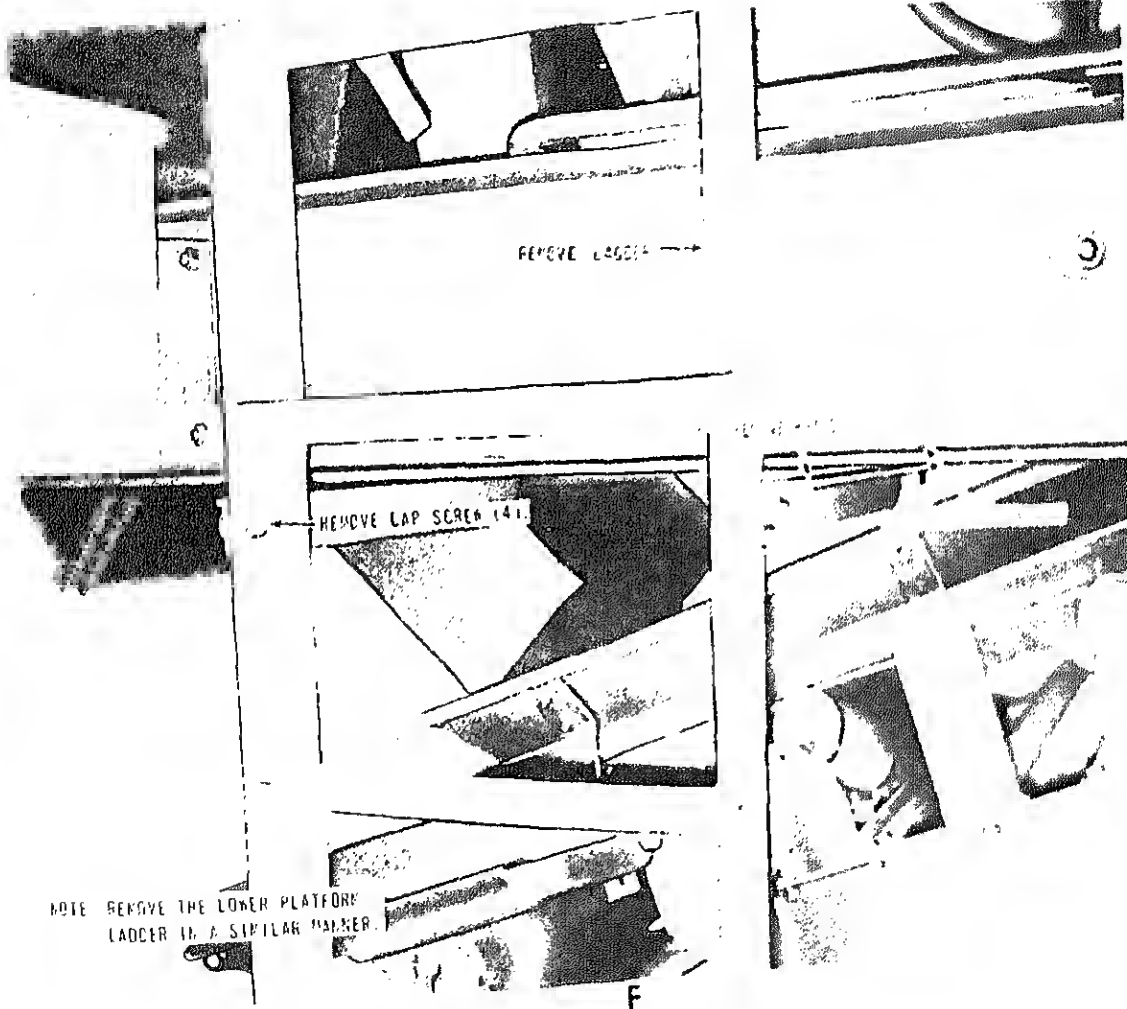
D—Battery box grating cover installed view

Figure 105—Continued.

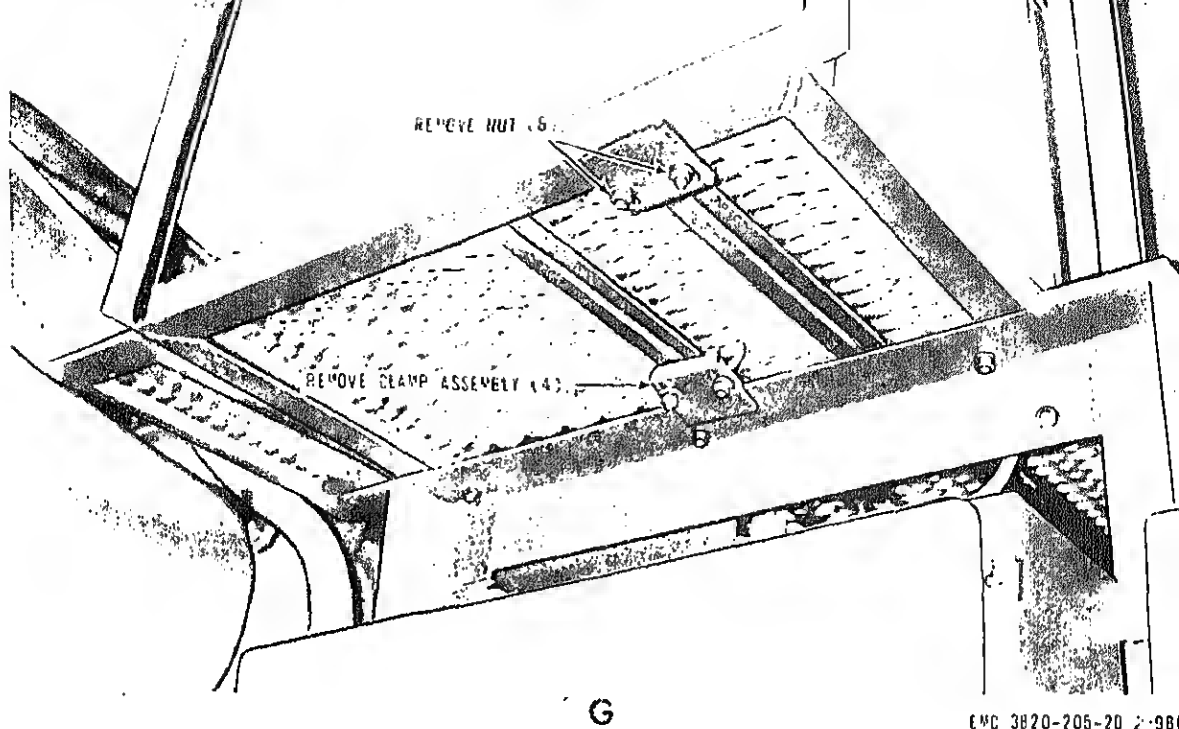


E -Conveyor transport bracket and lower platform grating installed view

Figure 103—Continued.



F--Upper platform ladder removal
 Figure 103--Continued



G. Lower platform ladder installed view
Figure 103--Continued.

Section IX. REAR WHEELS, TIRES, AND BRAKE ASSEMBLY

171. General

The rear wheels, tires, and brake assembly consists of wheels, tires, hub, slack adjusters, and brake assembly. The wheels are dual-type and separated by a spacer. The assembly is secured to the hub and brakedrum.

172. Rear Wheels and Tires

a. Removal. Remove the rear wheels and tires in the same manner as the dolly wheels and tires (par. 115a).

b. Cleaning, Inspection, and Repair. Clean and inspect, replace or repair the tires and wheels in the same manner as the dolly wheels

173. Rear Wheel Hub Assembly and Brakedrum

a. Removal.

- (1) Remove the rear wheel assembly (par. 172).
- (2) Remove and disassemble the bearings, hub, and brakedrum assembly (par. 116).

b. Cleaning and Inspection. Clean and inspect all parts. Replace all damaged or defective parts. Lubricate wheel bearing (par. 116).

c. Installation.

- (1) Reassemble and install the

chamber (par. 139).

- (2) Remove slack adjuster as instructed on figure 104.

b. Cleaning and Inspection. Clean and inspect all parts. Replace all damaged or defective parts.

c. Installation.

- (1) Install the slack adjuster in reverse of instructions on figure 104.
- (2) Connect linkage to air brake chamber (par. 139).

d. Adjustment. Adjust the slack adjusters as instructed on figure 104.

(par. 116).

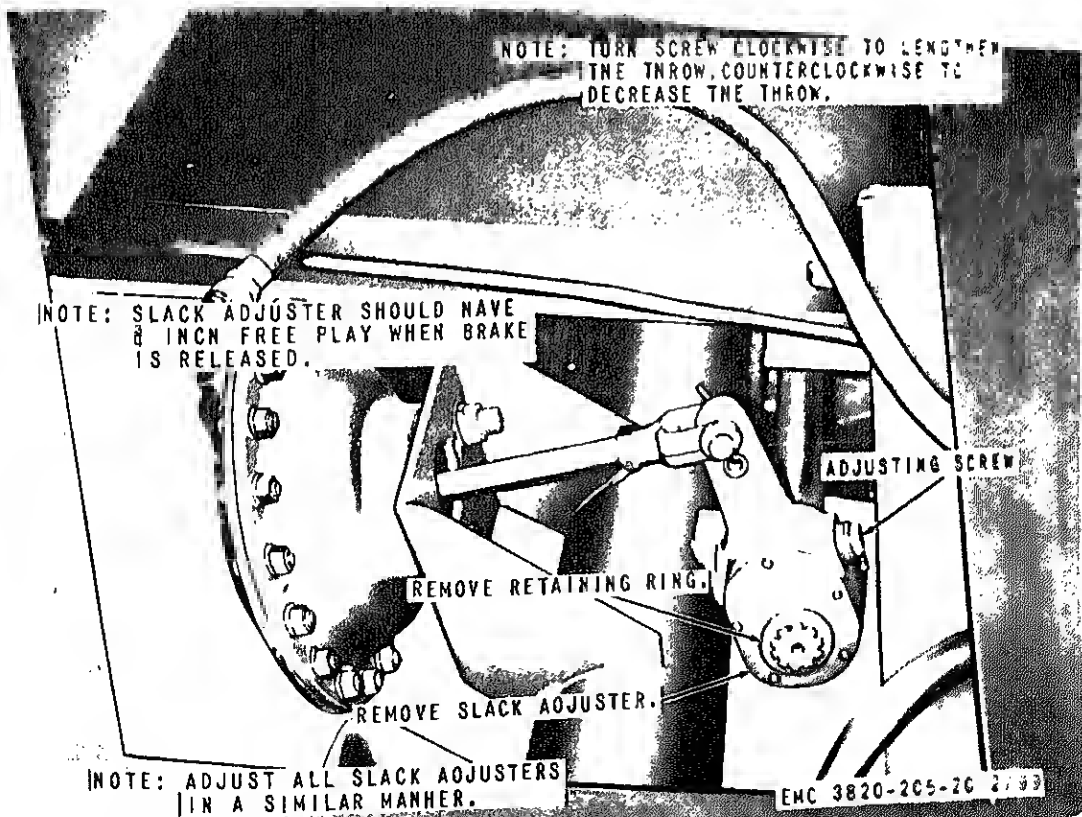
- (2) Remove the brake assembly as instructed on figure 105.

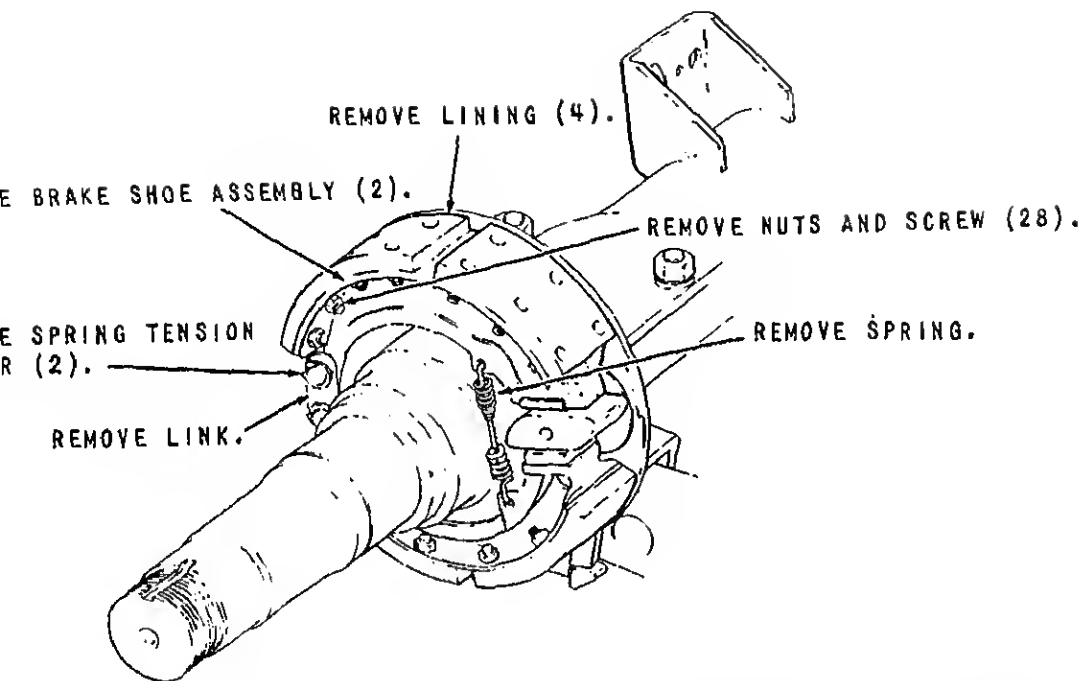
b. Cleaning, Inspection, and Adjustment. Clean and inspect all parts. Replace all damaged or defective or worn parts.

c. Installation.

- (1) Install the brake assembly as instructed on figure 105.
- (2) Install the wheel hub assembly (par. 116).

d. Adjustment. Adjust the slack adjusters (par. 174).





NOTE: REMOVE REMAINING BRAKE SHOE ASSEMBLIES IN A SIMILAR MANNER.

EMC 3820-205-20/2/100

Figure 105. Brake assembly, removal and installation.

CHAPTER 7

SHIPMENT AND LIMITED STORAGE

Section I. SHIPMENT WITHIN ZONE OF INTERIOR

176. Preparation of Jaw Crusher for Shipment

a. *General.* Detailed instructions for the preparation of the jaw crusher for domestic shipment are outlined within this paragraph. Preservation will be accomplished in sequence that will not require the operation of previously preserved components.

b. *Inspection.* The jaw crusher will be inspected for any unusual conditions such as damage, rusting, accumulation of water, and pilferage. Inspection shall be completed as outlined on the quarterly preventive maintenance Services. All deficiencies will be recorded on DA Form 2404 (Equipment Inspection and Maintenance Worksheet).

c. *Cleaning and Drying.* Clean and dry the jaw crusher by an approved method. Approved methods of cleaning and drying, types of preservatives, and methods of application are described in TM 38-230.

d. *Painting.* Paint all surfaces when the paint has been removed or damaged. Refer to TB ENG 60 for detailed cleaning and painting instructions.

e. *Depreservation Guide.* A properly annotated DA Form 2258 (Depreservation Guide of Engineer Equipment) will be completed concurrently with preservation for each item of mechanical equipment. Any peculiar requirements will be outlined in blank spaces 27 through 33. The completed depreservation guide will be placed in a waterproof envelope.

solution of 50 percent water-pumpable ethylene glycol conforming to Specification MIL-11796, class 1.

Note. It is not necessary to drain the system if the solution is water-pumpable. If temperatures below -20° F are encountered, the solution must be replaced with one conforming to Specification MIL-11796, class 1 in its undiluted condition.

g. *Lubrication System.* If the oil level is low and no leaks are apparent, refer to the lubrication chart and fill with the recommended lubricant. Operate the engine at a fast idle until the lubricant has been circulated throughout the system.

h. *Sealing of openings.* Openings must be sealed to permit the direct entry of water into the interior of engine-driven equipment. Motors, engine, etc., shall be sealed with preservative tape conforming to Specification MIL-T-60, type 111, class 1.

i. *Fuel Tank.* If the fuel tank is empty, it will be fogged with type P-10, grade 2, preservative oil, conforming to MIL-11796, class 1. It is not necessary to drain fuel tanks for domestic shipment.

j. *Hydraulic Control System.* Refer to TM 38-230 for Hydraulic Brake.

- (1) Fully retract the piston rod until the linkage will permit an inspection.
- (2) Coat exposed portion of the piston rods and operating controls with type P-6 preservative oil conforming to Specification MIL-11796, class 3. If possible, apply the

n. Batteries and Cables. Batteries will be secured in compartments. Batteries will be filled and fully charged. Cables will be disconnected and secured so as to prevent contact with the terminals.

o. Pneumatic Tires. Tires will be inflated to their normal required operating pressure.

p. Air Receivers. Remove pipe plugs from tanks and spray or fog the tank interior with type P-10, grade 2, engine preservative oil conforming to Specification MIL-L-21260 and re-install. Open draincock to allow excess preservative oil to drain. Leave draincock open to allow condensation to drain.

q. Disassembly, Disassembled Parts, Basic Issue Items.

- (1) Disassembly will be limited to the removal of parts and projecting com-

equipment to prevent movement. Shroud exposed hose not protected by storage facilities with waterproof Kraft wrapping paper (UU P-271).

177. Loading Jaw Crusher for Shipment

a. Construct a ramp of suitable material illustrated on figure 3, and tow the jaw crusher onto the carrier as instructed in paragraph 6.

b. If a loading ramp or material is not available and a suitable lifting device illustrated on figure 4 is used, the equipment will be loaded as follows:

- (1) Attach lifting cables to jaw crusher as instructed in paragraph 6.
- (2) Lift the jaw crusher and place it in the center of the carrier.
- (3) Remove lifting cables from the jaw crusher. Block and secure the jaw crusher as illustrated on figure 2.

Section II. LIMITED STORAGE

78. Preparation of Jaw Crusher for Storage

a. General. Detailed instructions for preparing the jaw crusher for limited storage is outlined in this paragraph. Limited storage is defined as storage not to exceed 6 months. Refer to AR 743-505.

b. Inspection. Refer to paragraph 176b.

c. Cleaning and Drying. Refer to paragraph 176c.

d. Painting. Refer to paragraph 176d.

e. Depreservation Guide. Refer to paragraph 176e.

f. Cooling System. Refer to paragraph 176f.

g. Lubrication System. Refer to paragraph 176g.

h. Sealing of Openings. Refer to paragraph 176h.

i. Fuel Tank. Tanks will be drained and sprayed or fogged with type P-10, grade 2, engine preservative oil conforming to Specification MIL-L-21260.

j. Hydraulic Control System; Except Hydraulic Brake. Refer to paragraph 176j.

k. Exterior Surfaces. Refer to paragraph 176k.

3. Fire Protection

- FM 5-687 Repairs and Utilities: Fire Protection Equipment and Appliances; Inspections, Operations, and Preventive Maintenance.
- FM 9-1799 Ordnance Maintenance: Fire Extinguishers.

4. Lubrication

- FM 5-3820-205-20/2 Lubrication Order.

5. Operating Instructions

- FM 5-3820-205-10/2 Operator's Manual.

6. Painting and Preservation

- FM ENG 60 Preservation and Painting of Serviceable Corps of Engineers Equipment.
- FM 9-213 Painting Instructions for Field Use.

7. Preventive Maintenance

- FM 750-5 Organization, Policies, and Responsibilities for Maintenance Operations.
- FM 9-1870-1 Care and Maintenance of Pneumatic Tires.
- FM 9-6140-200-15 Storage Batteries, Lead-Acid Type.
- FM 38-750 The Army Equipment Records System and Procedures.

8. Publication Indexes

- DA Pam 108-1 Index of Army Motion Pictures, Film Strips, Slides, and Phono-Recordings.
- DA Pam 310-1 Index of Administrative Publications.
- DA Pam 310-2 Index of Blank Forms.
- DA Pam 310-3 Index of Doctrinal, Training, and Organizational Publications.
- DA Pam 310-4 Index of Technical Manuals, Technical Bulletins, Supply Manuals, (types 4, 6, 7, 8, and 9), Supply Bulletins, Lubrication Orders, and Modification Work Orders.
- DA Pam 310-5 Index of Graphic Training Aids and Devices.
- DA Pam 310-25 Index of Supply Manuals—Corps of Engineers.

II. Training Aids

FM 5-25

Explosives and Demolitions.

FM 21-5

Military Training.

FM 21-6

Techniques of Military Instruction.

FM 21-30

Military Symbols.

APPENDIX II

MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTION

1. General

This Appendix contains explanations of all maintenance and repair functions authorized for the various echelons. Section II contains the maintenance allocation chart.

2. Maintenance

Maintenance is any action taken to keep material in a serviceable condition or to restore it to serviceability when it is unserviceable. Maintenance of material includes the following:

a. Service. To clean, preserve, and replenish fuel and lubricants.

b. Adjust. To regulate periodically to prevent malfunction.

c. Inspect. To verify serviceability and detect incipient electrical or mechanical failure by scrutiny.

d. Test. To verify serviceability and detect incipient electrical or mechanical failure by use of special equipment such as gages, meters, and the like.

e. Replace. To substitute serviceable assemblies, subassemblies, and parts for unserviceable components.

f. Repair. To restore an item to serviceable condition through correction of a specific failure or unserviceable condition. This function includes, but is not limited to, inspecting, clean-

weapons system, or components of a weapons system.

i. Overhaul. To restore an item to completely serviceable condition as prescribed by serviceability standards developed and published by heads of technical services. This is accomplished through employment of the technique of "Inspect and Repair Only as Necessary" (IROAN). Maximum utilization of diagnostic and test equipment is combined with minimum disassembly of the item during the overhaul process.

3. Explanation of Columns

a. Functional Group. The functional group is a numerical group set up on a functional basis. The applicable functional grouping indexes (obtained from the Mobility Command functional grouping indexes) are listed on the maintenance allocation chart in the appropriate numerical sequence. These indexes normally are set up in accordance with their function and proximity to each other.

b. Components and Related Operation. The column contains the Functional Grouping Index heading, subgroup headings, and a brief description of the part starting with the nominal name. It also designates the operations to be performed such as service, adjust, inspect, test, replace, repair, and overhaul.

indicated functions of lower echelons.

the operation being performed.

Functional group	Components and related operation	Echelons of maintenance					Remarks
		1	2	3	4	5	
1	ENGINE						
0100	ENGINE ASSEMBLY						
	Engine, Diesel						
	Service -----	X					
	Inspect -----	X					
	Test -----			X			Compression.
	Replace -----				X		
	Repair -----			X			
	Overhaul -----				X		
0101	CRANKCASE, BLOCK, CYLINDER HEAD						
	Cylinder and Crankcase Assembly						
	Repair -----			X			
	Sleeves, Cylinder						
	Replace -----				X		
	Head, Cylinder						
	Replace -----			X			
	Repair -----			X			
0102	CRANKSHAFT						
	Crankshaft Assembly						
	Replace -----				X		
	Repair -----					X	Metalized grinding alignment
	Pulley and Damper, Vibration						
	Replace -----			X			
	Bearings, Main						
	Replace -----				X		
0103	FLYWHEEL ASSEMBLY						
	Flywheel Assembly						
	Repair -----				X		Replacing ring gear
0104	PISTONS, CONNECTING RODS						
	Pistons; Rings; Pins; Retainers; Bearings						
	Replace -----				X		
	Rods, Connecting						
	Replace -----				X		
	Repair -----				X		
0105	VALVES, CAMSHAFTS AND TIMING SYSTEM						
	Valves and Seats						
	Replace -----				X		
	Repair -----				X		

	Replace		X		
	Rods, Push			X	
	Replace				
	Followers, Cam; Camshaft; Bearings; Gears; Seals; Cover				
	Replace				X
0106	ENGINE LUBRICATION SYSTEM				
	Pump, Oil				
	Replace				X
	Repair				X
	Filter Assembly, Oil				
	Service	X			
	Replace		X		
	Cooler, Oil				
	Replace		X		
	Valve, By-pass				
	Replace		X		
	Breather				
	Service	X			
	Replace		X		
	Pan, Oil				
	Replace				X
	Lines				
	Replace		X		
	Gage, Level				
	Replace	X			
0107	ENGINE STARTING SYSTEM				
	Crank, Hand				
	Replace		X		
	Support Assembly				
	Repair		X		
0108	MANIFOLDS				
	Manifolds				
	Replace		X		
02	CLUTCH ASSEMBLY				
0200	CLUTCH ASSEMBLY				
	Clutch Assembly				
	Service	X			
	Adjust	X			
	Repair				X
	Disks				
	Replace				X
	Repair				X
	Plates				
	Replace				X
0202	CLUTCH RELEASE MECHANISM				
	Shaft, Cross; Yoke, Throwout				
	Replace				X
	Lever				
	Replace		X		
03	FUEL SYSTEM				

Exter

Code	Item	Ref	G	O
0302	FUEL PUMPS			
	Injection Pump, Diesel			X
	Replace			X
	Repair			
	Drive, Injection Pump			X
	Replace			X
	Repair			
0304	AIR CLEANER			
	Air Cleaner Assembly	X		
	Service		X	
	Repair			
0306	TANKS, LINES, FITTINGS			
	Tank, Fuel	X		
	Service		X	
	Replace			
	Cap, Fuel Tank		X	
	Replace			
	Lines		X	
	Replace		X	
	Repair			
	Fittings		X	
	Replace			
0308	ENGINE SPEED GOVERNOR			
0309	FUEL FILTERS			
	Filter Assembly	X		
	Service		X	
	Replace			
0311	ENGINE STARTING AIDS			
	Starting Aid, Ether	X		
	Service		X	
	Replace			
	Lines and Fittings		X	
	Replace			
0312	THROTTLE CONTROLS			
	Controls, Throttle		X	
	Replace			
04	EXHAUST SYSTEM			
0401	MUFFLER AND PIPES			
	Muffler and Pipes, Exhaust		X	
	Replace			
05	COOLING SYSTEM			
0501	RADIATOR			
	Radiator Assembly	X		
	Service		X	
	Inspect			X

0503	HEADERS, THERMOSTATS AND GASKET				
	Thermostat				
	Test -----		X		
	Replace -----		X		
	Fittings; Hoses; Clamps; Header				
	Replace -----		X		
0504	WATER PUMP				
	Pump Assembly, Water				
	Service -----	X			
	Replace -----		X		
	Repair -----			X	
0505	FAN ASSEMBLY				
	Fan, Engine Cooling				
	Replace -----		X		
	Guard, Fan				
	Replace -----		X		
	Belts, Fan				
	Adjust -----	X			
	Replace -----		X		
06	ELECTRICAL SYSTEM				
0601	GENERATOR				
	Generator Assembly				
	Test -----		X		
	Replace -----		X		
	Repair -----			X	
	Brushes				
	Replace -----		X		
0602	GENERATOR REGULATOR				
	Regulator, Generator				
	Adjust -----		X		
	Test -----		X		
	Replace -----		X		
0603	STARTING MOTOR				
	Starter Assembly				
	Service -----	X			
	Test -----		X		
	Replace -----		X		
	Repair -----			X	
	Brushes; Solenoid				
	Replace -----		X		
0606	ENGINE SAFETY CONTROLS				
	Switch, Engine Safety Control				
	Replace -----		X		
	Governor, Overspeed				
	Replace -----		X		
	Repair -----				X
0607	INSTRUMENT OR ENGINE CONTROL PANEL				
	Gages; Switches				
	Replace -----		X		

0609	LIGHTS				
	Lamps; Doors; Lens; Lights				
	Replace		X		
0610	SENDING UNITS				
	Sending Units				
	Replace		X		
0612	BATTERIES				
	Batteries				
	Service	X			
	Test		X		
	Replace		X		
	Box; Cables				
	Repair		X		
0613	HULL OR CHASSIS WIRING HARNESS				
	Wiring, Chassis				
	Repair		X		
	Coupling, Trailer Electrical				
	Replace		X		
	Repair		X		
0615	RADIO INTERFERENCE SUPPRESSION				
	Components				
	Test		X		
	Replace		X		
0	FRONT AXLE				
1000	FRONT AXLE ASSEMBLY				
	Dolly; Drawbar; Lunette				
	Replace		X		
	Axle; Frame				
	Replace			X	
11	REAR AXLE				
1100	REAR AXLE ASSEMBLY				
	Axle Assembly, Rear				
	Repair			X	
1108	WALKING BEAMS				
	Beams, Walking				
	Service	X			
	Repair			X	
12	BRAKES				
1202	SERVICE BRAKES				
	Brakes Assemblies				
	Repair		X		
1206	MECHANICAL BRAKE SYSTEM				
	Slack Adjusters				
	Service	X			
	Adjust		X		
	Replace		X		

	Chambers, Air		X	
	Replace -----	--	X	
	Repair -----	--		X
	Valve, Relay			
	Replace -----	--	X	
	Repair -----	--		X
	Filters, Air			
	Service -----	X		
	Replace -----	--	X	
	Reservoir, Air			
	Service -----	X		
	Replace -----	--		X
	WHEELS			
311	WHEEL ASSEMBLY			
	Wheel Assemblies			
	Service -----	--	X	
	Repair -----	--	X	
313	TIRES, TUBES			
	Tires			
	Service -----	X		
	Replace -----	--		X
	Tubes			
	Replace -----	--	X	
	Repair -----	--	X	
	FRAME, TOWING ATTACHMENTS			
501	FRAME ASSEMBLY			
	Frame Assembly			
	Replace -----	--		X
	Platforms; Ladders			
	Replace -----	--		X
503	PINTLES			
	Hooks, Pintle			
	Service -----	X		
	Repair -----	--		X
506	FIFTH WHEEL			
	Fifth Wheel Assembly			
	Service -----	X		
	Repair -----	--		X
	BASIC ISSUE ITEMS, MANUFACTURER INSTALLED			
100	BASIC ISSUE ITEMS, MANUFACTURER OR DEPOT INSTALLED			
	Accessories			
	Replace -----	X		
	BASIC ISSUE ITEMS TROOP INSTALLED			
200	BASIC ISSUE ITEMS TROOP INSTALLED OR AUTHORIZED			
	Accessories; Common Tools; Publications			

18	HOOD				
1801	HOOD				
	Housing Assembly				
	Replace -----		X		
1808	STOWAGE RACKS, BOXES				
	Box, Tool				
	Replace -----		X		
	Reel, Power Cable				
	Repair -----		X		
22	ACCESSORY ITEMS				
2202	ACCESSORY ITEMS				
	Reflectors				
	Replace -----		X		
	Cables and Hose				
	Replace -----		X		
2210	DATA PLATES AND INSTRUCTION HOLDERS				
	Plates, Data				
	Replace -----			X	
	Plates, Identification and Instruction; Holder, Instruction				
	Replace -----		X		
40	ELECTRIC MOTORS				
4000	MOTOR ASSEMBLY				
	Service -----		X		
	Replace -----		X		
	Repair -----			X	
	Overhaul -----				X
4001	ROTOR ASSEMBLIES				
	Rotor				
	Replace -----			X	
4002	STATOR ASSEMBLIES				
	Stator Assemblies				
	Replace -----			X	
	Repair -----				X
4004	VENTILATING SYSTEM				
	Guard, Dust				
	Replace -----		X		
	Fan, Cooling				
	Replace -----			X	
4006	FRAME SUPORTS AND HOUSINGS				
	End Assembly; Frame, Center				
	Replace -----			X	
	Repair -----				X
	Box, Junction				
	Replace -----		X		
4007	DRIVE COMPONENTS				
	Pulley				
	Replace -----		X		
	Belts				
	Adjust -----		X		
	Replace -----			X	
4009	CONTROL PANELS				
	Panel, Main Control				

4018	Replace			X
	TERMINAL BLOCKS			
	Conduit, Power; Connectors; Receptacle			
	Replace			X
	Cable, Power			
	Replace		X	
	Wiring			
	Repair		X	
43	HYDRAULIC SYSTEMS			
4300	HYDRAULIC SYSTEM			
	System, Hydraulic			
	Service	X		
	Inspect	X		
4301	HOSE			
	Hose			
	Replace		X	
4302	PUMP			
	Pump and Mounting Parts			
	Repair		X	
4307	HYDRAULIC CYLINDERS			
	Cylinder, Hydraulic			
	Repair			X
4308	RESERVOIRS			
	Reservoir, Oil			
	Service	X		
	Replace		X	
47	GAGES; MEASURING DEVICES			
4701	INSTRUMENTS SPEED			
	Tachometer and Hour-meter Combination			
	Replace		X	
	Tachometer Drive			
	Replace		X	
	Repair		X	
4702	GAGES			
	Gage, Fuel			
	Replace		X	
75	CRUSHING EQUIPMENT COMPONENTS			
7501	BELTING			
	Belts, Main Drive			
	Adjust		X	
	Replace		X	
	Pulley, Main Drive			
	Replace			X
	Guards and Attaching Parts			
	Replace		X	
	Conveyor Assembly, Discharge			
	Repair		X	
	Frame, Conveyor; Hopper			
	Replace			X
	Belting			
	Adjust		X	
	Replace			X

Functional group	Components and related operation	1	2	3	4	5	
7503	PULLEYS						Conveyor head pulley.
	Bearings	X					
	Service -----			X			
	Replace -----						
	Shaft and Pulley-----						
	Replace -----			X			
7504	ROLLS						
	Roller Assembly		X				
	Repair -----						
7506	SHAFTS						
	Gear Assembly, Conveyor Drive	X					
	Service -----		X				
	Replace -----			X			
	Repair -----						
	Pulleys -----		X				
	Replace -----						
7510	FEEDING FRAMES						
	Feeder Assembly			X			
	Repair -----						
	Hopper			X			
	Replace -----						
7512	FEEDING SHAFTS						
	Gear Assembly, Feeder Drive	X					
	Service -----			X			
	Replace -----			X			
	Repair -----						
	Pulleys -----				X		
	Replace -----						
	Arm, Torque; Foot; Turn Buckle			X			
	Replace -----						
7515	PAN FEEDER						
	Apron Assembly	X					
	Service -----		X				
	Repair -----						
	Rollers			X			
	Replace -----			X			
	Repair -----						
	Bars; Pins			X			
	Replace -----						
7520	CRUSHER FRAMES						
	Crusher Assembly		X				
	Service -----		X				
	Inspect -----			X			
	Repair -----						
	Frame					X	
	Replace -----						
	Springs			X			

	Replace -----				X
	Seats and Plates, Toggle				
	Replace -----			X	
	Pitman				
	Repair -----				X
	Gear Box Assembly, Jaw Adjust				
	Replace -----			X	
	Repair -----			X	
7523	SHAFTS				
	Shaft Assemblies				
	Replace -----				X
	Rearing and Seals				
	Replace -----				X
	Wheel, Balance				
	Replace -----			X	
7525	SCREENING BASE, BOX				
	Box and Plates				
	Replace -----				X
	Rail, Center and Crossmember, Feed				
	Replace -----			X	
	Mounting, Rubber				
	Replace -----			X	
	Deflector, Rubber				
	Replace -----			X	
	Underhopper				
	Replace -----				X
	Box Divert; Chute; Gate				
	Replace -----			X	
7528	SCREENS AND ATTACHING PARTS				
	Screens				
	Replace -----		X		
	Bar, Grizzly				
	Replace -----			X	
	Screen Assembly, Vibrating				
	Repair -----			X	
7529	ECCENTRIC OR GYRATOR SHAFT				
	Shaft Assembly				
	Service -----		X		
	Replace -----				X
	Bearings				
	Replace -----				X
	Guard and Pulley				
	Replace -----		X		
	Wheel, Balance				
	Replace -----			X	
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7603	FIRE EXTINGUISHERS				

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			Sealing of openings	
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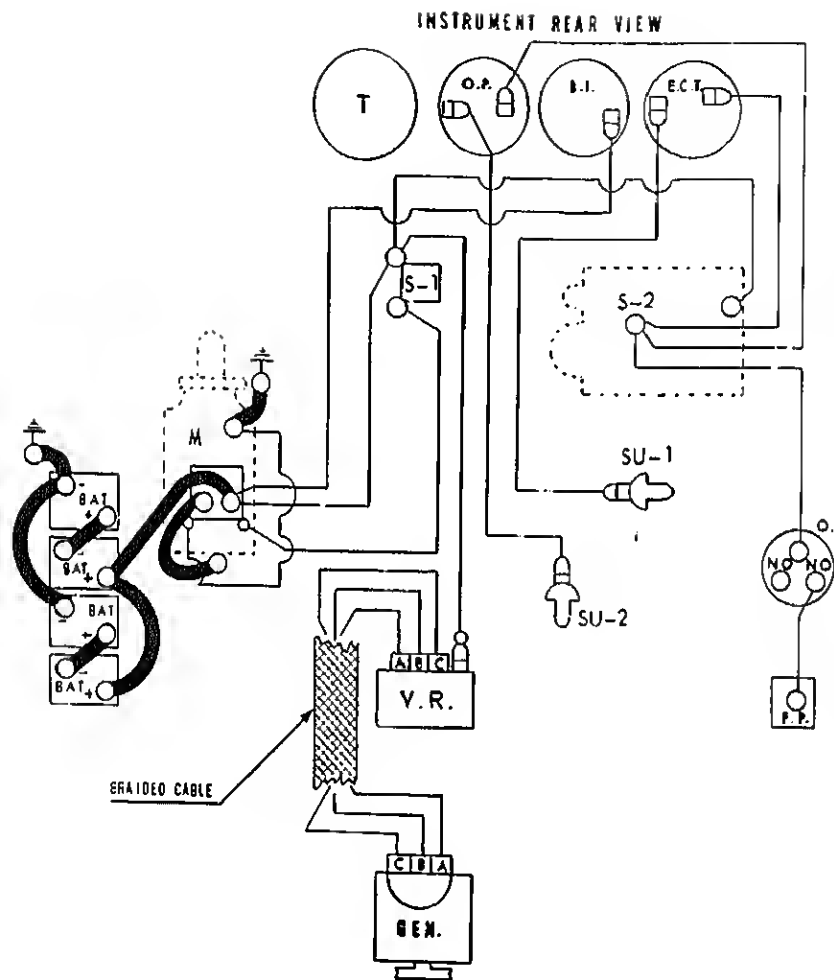
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CNGB (1)	Army Tml (1)
CofEngrs (3)	USAOSA (2)
CSigO (1)	Engr Dist (2)
CofT (1)	Div Engr (2)
TSG (1)	Engr Fld Maint Shops (2)
USA Maint Bd (1)	USAERDL (3)
USAARTYBD (2)	Engr Cen (5)
USAARMRD (2)	AMS (3)
USAIR (2)	Chicago Proc Ofc (10)
USARADBD (2)	USA Mob Spt Cen (36)
USAAESWRD (2)	ESCO (10)
USAAVNBD (2)	Fld Comd, DASA (8)
USCONARC (3)	USACOMZEUR (2)
USASMCOM (1)	USAREUR Engr Sup Con Agency
USAMOCOM (2)	USAREUR Engr Proc Cen (2)
OS Maj Comd (5) except	MAAG (1)
USARJ (10)	JBUSMC (1)
USASETAF (2)	Units org under fol TOE:
MDW (1)	5-48 (2)
Armies (2)	5-114 (2)
Corps (2)	5-115 (2)
USA Corps (1)	5-117 (2)
Div (1)	5-237 (5)
Engr Bde (1)	5-262 (5)
USMA (2)	5-267 (1)
Svc Colleges (2)	5-278 (5)
Hr Svc Sch (2) except	5-279 (2)
USAES (100)	5-500 (EA, EB) (2)
Engr Sec, GENDEP (OS) 10)	

• NG: None.

USAR: Same as Active Army except allowance is one copy to each unit.

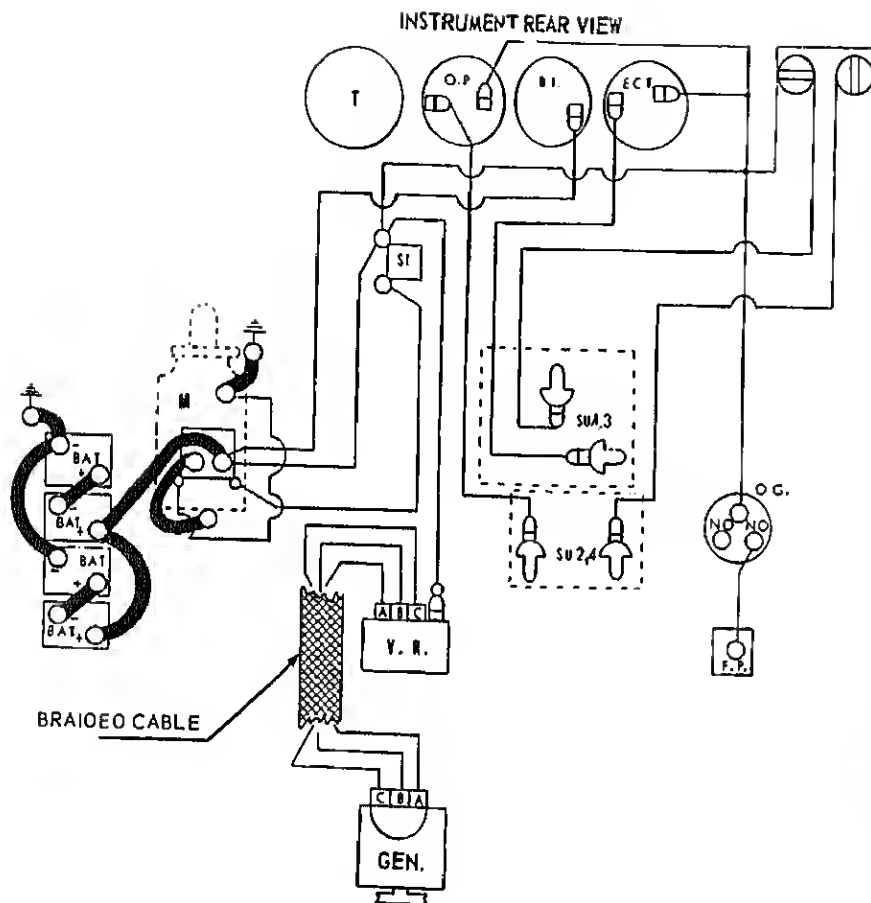
For explanation of abbreviations used, see AR 320-50.



MSC 38

1 Serial No. range 2050 through 2087

Figure 1. Wiring diagram.



LEGEND

BAT.	BATTERY
B.I.	BATTERY GENERATOR INDICATOR GAGE
E.C.T.	ENGINE COOLANT TEMPERATURE GAGE
F.P.	FUEL INJECTION PUMP
GEN.	GENERATOR
M.	STARTER MOTOR
N.O.	NORMALLY OPEN
O.P.	ENGINE OIL PRESSURE
O.G.	OVER SPEED GOVERNOR
SI	STARTER-IGNITION SWITCH
SU1,3	SENDING UNIT ENGINE COOLANT TEMPERATURE
SU2,4	SENDING UNIT ENGINE OIL PRESSURE
T.	TACHOMETER
V.R.	VOLTAGE REGULATOR

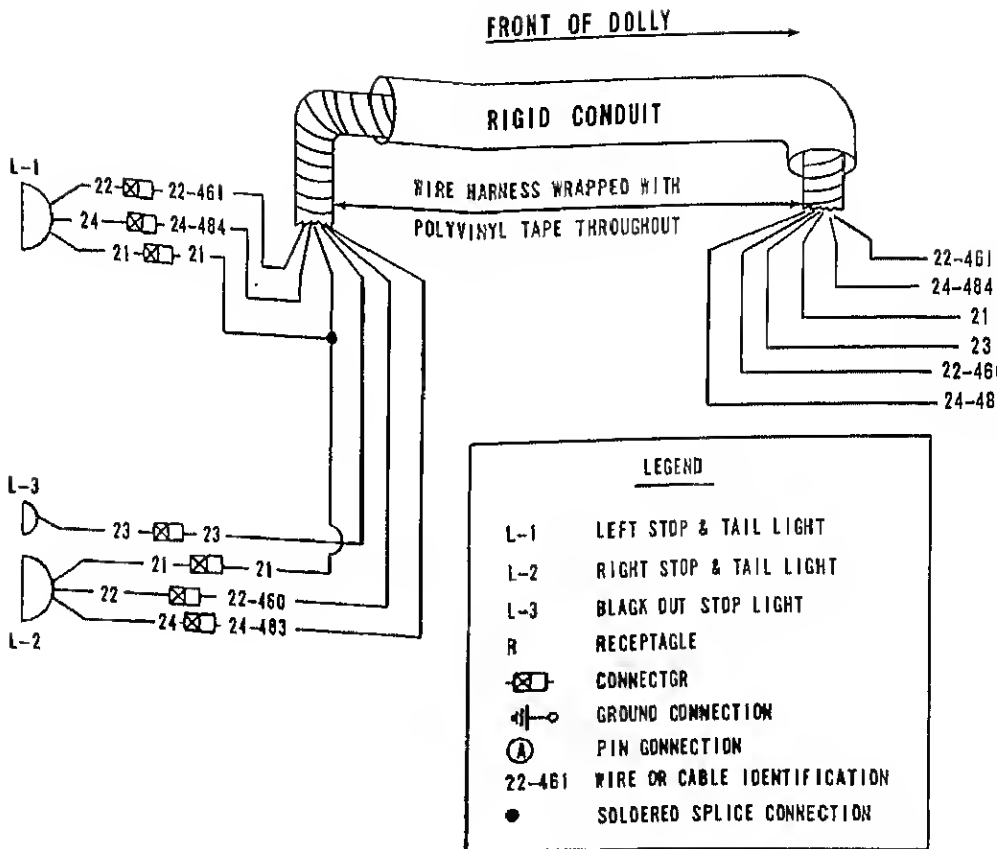
SYMBOL

-	NEGATIVE
+	POSITIVE
□	CONNECTOR
⊖	GROUND CONNECTIONS
○	TERMINAL
⊠	PIN CONNECTION
⊕	OIL PRESSURE WARNING LIGHT
⊗	COOLANT TEMPERATURE WARNING LIGHT
—	WIRE CONNECTED

MSC 3820-205-20/1/

2 Serial No. range 2090 through 2129

Figure 1—Continued.



EMC 3820-20

3 Dolly wiring diagram

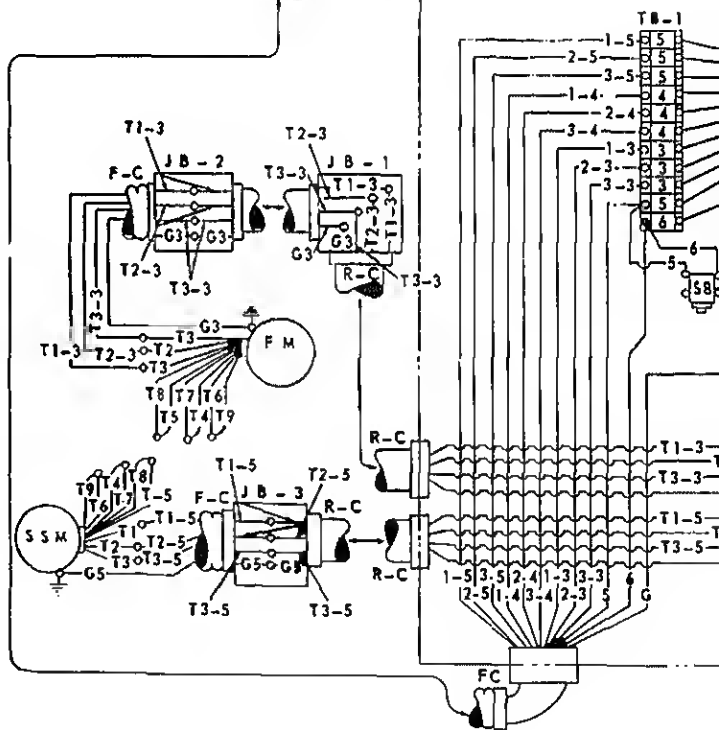
Figure 1—Continued.



Figure 1--Continued.

O ~~TERMINAL~~

The diagram shows a 7-line telephone exchange. Seven subscribers, labeled S1 through S7, are arranged in two rows. Each subscriber has two lines (1-7) connected to a central switch (F-C). A ground connection (G) is also shown.



NOTES: CIRCUIT BREAKERS PROTECT ROLL CRUSHER ELECTRICAL SYSTEM FROM OVERLOADS. THEY MUST BE IN THE "ON" POSITION FOR OPERATION.

ROTARY ELEVATOR
CIRCUIT BREAKER

RETURN (UNDER) CONVEYOR
CIRCUIT BREAKER

SIDE CONVEYOR NO. 2
CIRCUIT BREAKER

SIDE CONVEYOR NO. 1
CIRCUIT BREAKER

FEEDER CIRCUIT BREAKER

MAIN (FIELD) CONVEYOR
CIRCUIT BREAKER

VIBRATING SCREEN
CIRCUIT BREAKER

NOTE: CIRCUIT BREAKERS AUTOMATICALLY GO TO "OFF" POSITION WHEN AN OVERLOAD OCCURS. RESET TO "ON" POSITION WHEN TROUBLE IS CORRECTED.

AND A SPECIALTY TRIPPER TRIPS
CORRECT FIDUCIAL AND PRESS
RESET RODS IN CLOSE CIRCUIT

ROTARY ELEVATOR
OVERLOAD RESET RODS

RETURN (UNDER) CONVEYOR
OVERLOAD RESET RODS

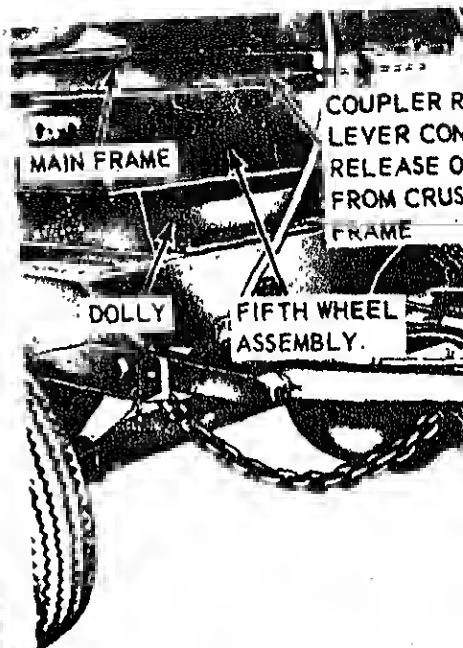
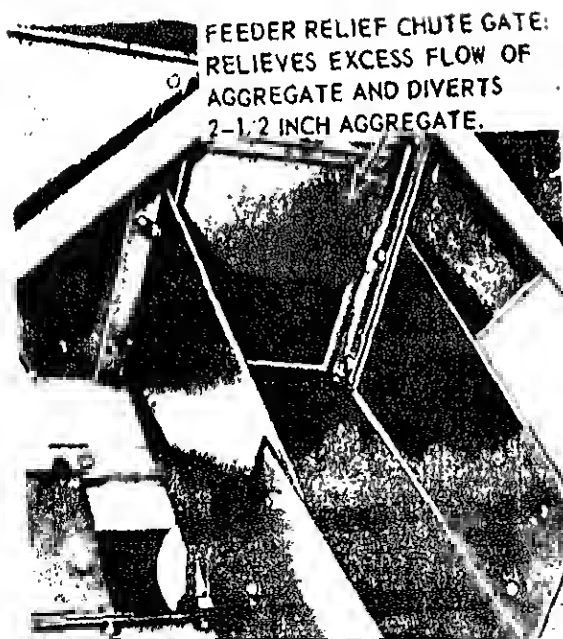
FEEDER OVERLOAD
RESET RODS

MAIN (FEED) CONVEYOR
OVERLOAD RESET RODS

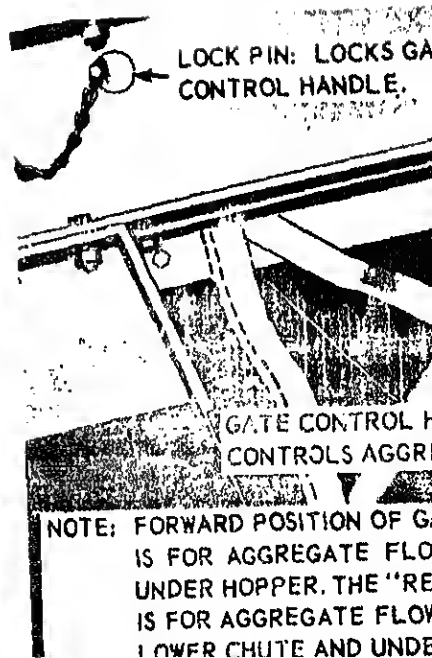
VIBRATING SCREEN
OVERLOAD RESET RODS

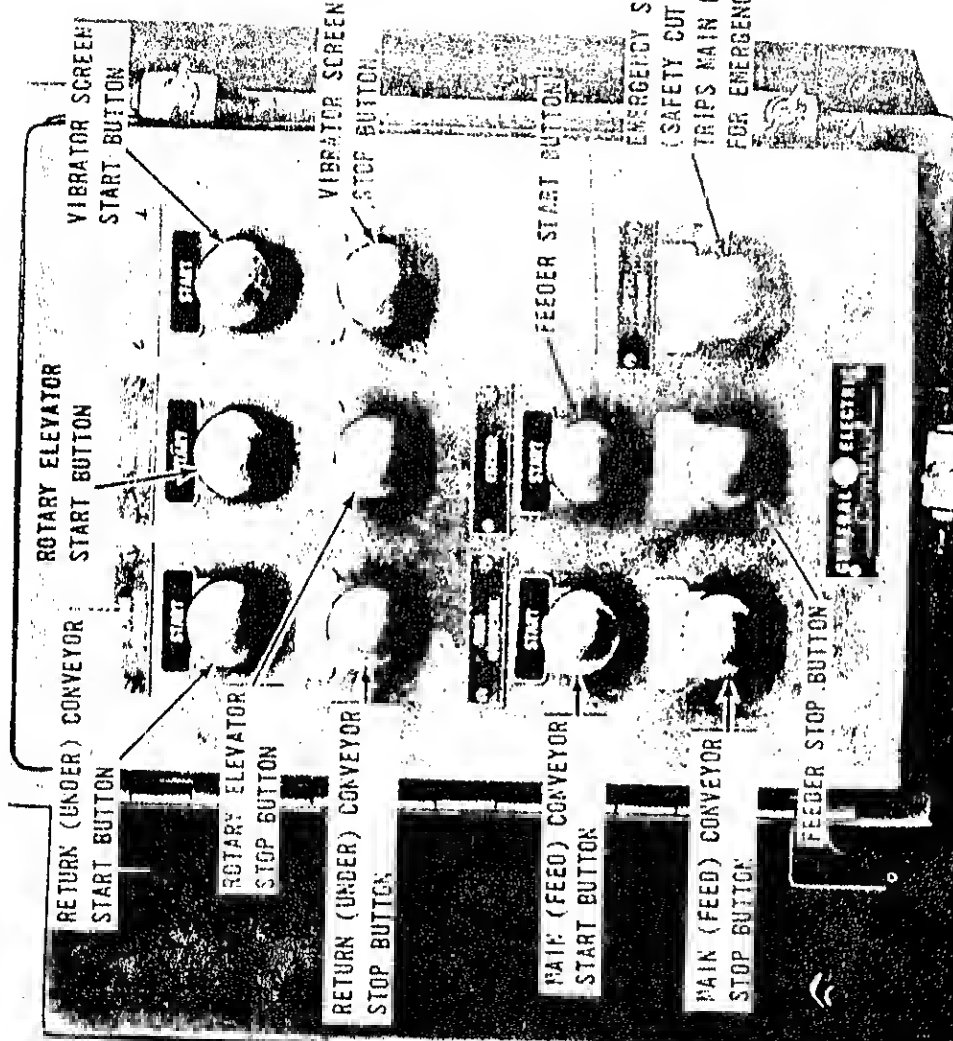


H

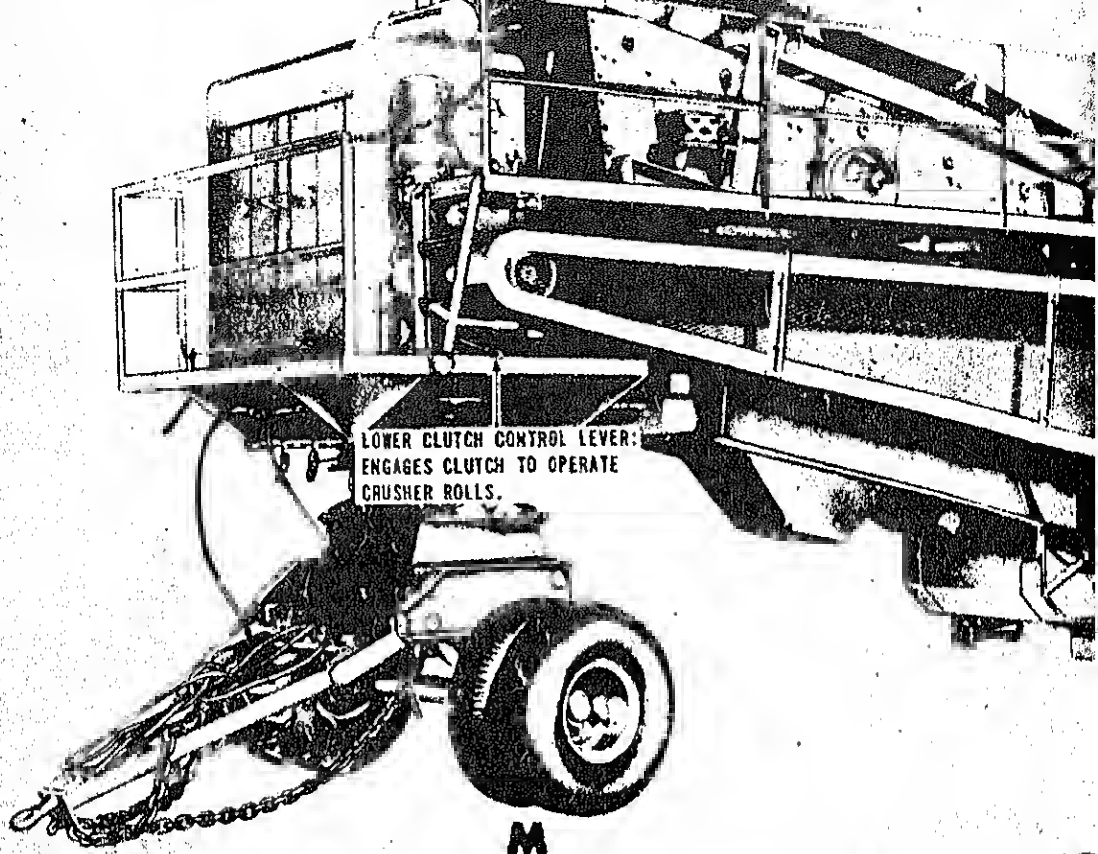


I





NOTE: START AND STOP BUTTONS CONTROL
ROLL CRUSHER ELECTRIC MOTORS.



MSC 3820-205-10/1/12 ⑥

M—Lower clutch control lever

Figure 12—Continued.

Section III. OPERATION OF EQUIPMENT

12. General

a. The instructions in this section are published for the information and guidance of the personnel responsible for the operation of the roll crusher.

b. The operator must know how to perform every operation of which the roll crusher is capable. This section gives instructions on

13. Starting the Engine

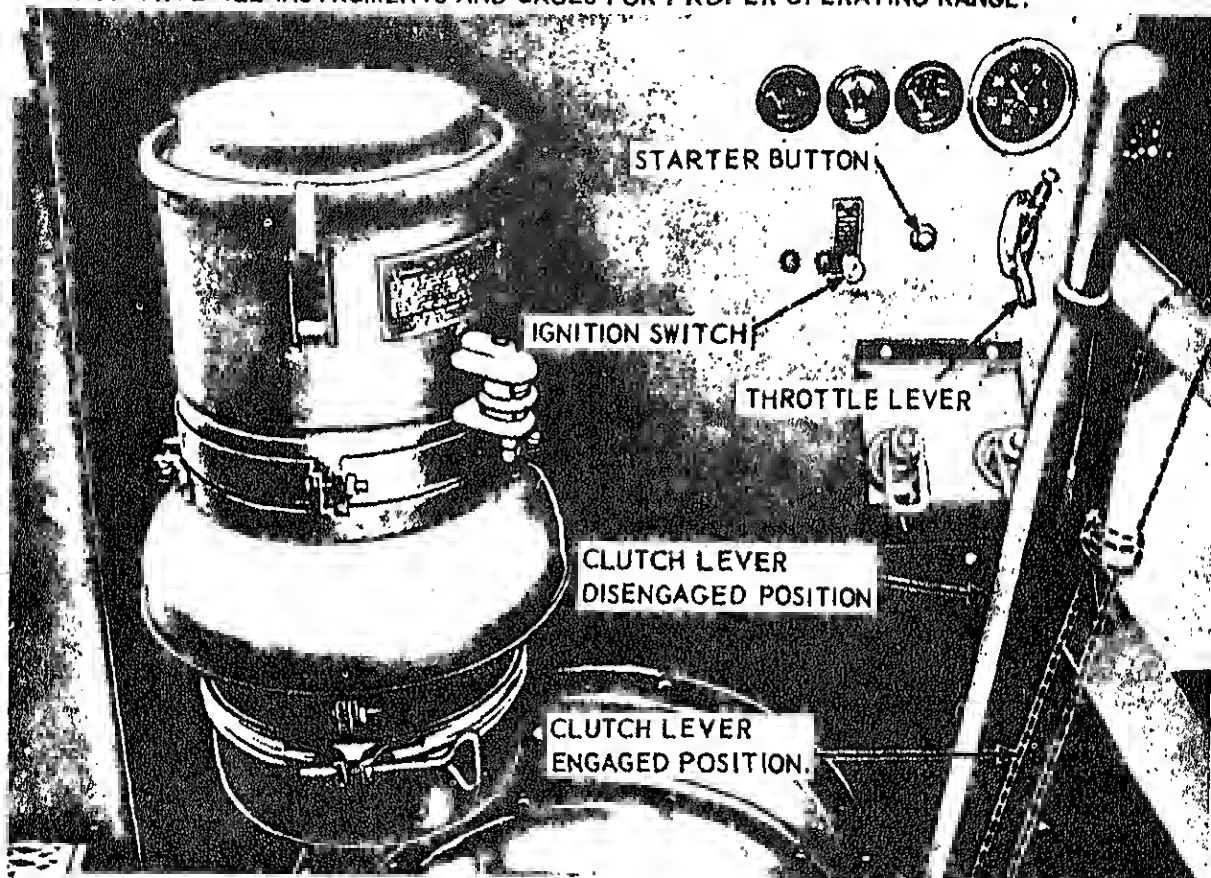
a. *Preparation for Starting.*

- (1) Perform the daily preventive maintenance services (par. 29).
- (2) See that the fuel shutoff valve (B, figure 12) is in the open position.

b. *Starting.* Start the engine in the numerical sequence as instructed on figure 12.

CAUTION: DO NOT CRANK THE ENGINE FOR MORE THAN 30 SECONDS AT A TIME. ALLOW ONE MINUTE BETWEEN ATTEMPTS IF ENGINE FAILS TO START.

1. DISENGAGE THE CLUTCH AND MOVE THE THROTTLE LEVER TO 1/4 OPEN.
2. TURN IGNITION SWITCH TO "ON" POSITION, PRESS STARTER BUTTON (RELEASE IMMEDIATELY WHEN ENGINE STARTS). (SEE NOTE)
3. MOVE THROTTLE LEVER TO "RUN" POSITION.
4. RUN ENGINE AT 1,100 RPM UNTIL OPERATING TEMPERATURE IS REACHED BEFORE APPLYING LOAD.
5. OBSERVE ALL INSTRUMENTS AND GAGES FOR PROPER OPERATING RANGE.



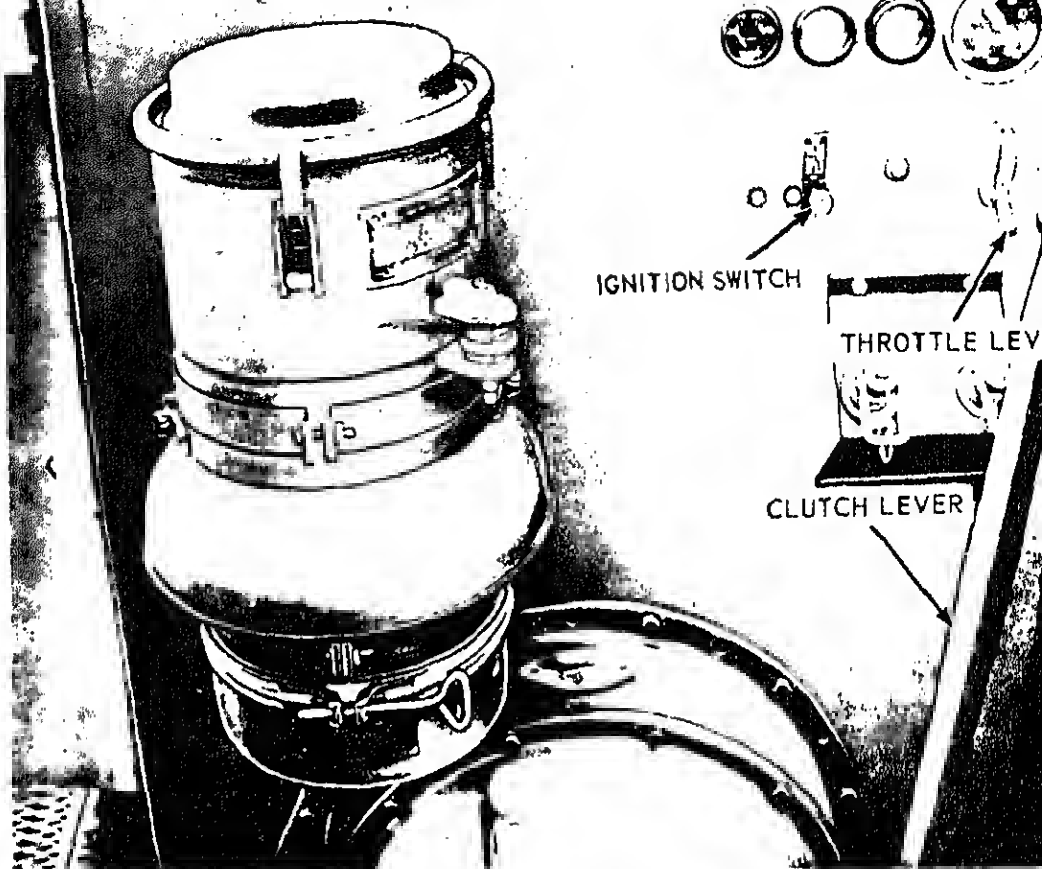
CAUTION: STOP ENGINE IF IGNITION SWITCH FAILS TO RETURN TO "RUN" POSITION AFTER ENGINE STARTS. APPLY LOAD ONLY AFTER COMPLETE ENGINE WARMUP.

NOTE: UNITS OF EQUIPMENT WITHIN SERIAL NUMBER RANGE 6590 THRU 6629 ARE EQUIPPED WITH A DUAL IGNITION-STARTER SWITCH.

NORMAL READINGS

ENGINE TEMPERATURE

145 16500



1. MOVE THROTTLE LEVER DOWN UNTIL ENGINE IDLES AT 600 RPM.
2. DISENGAGE CLUTCH.
3. ALLOW ENGINE TO IDLE 5 MINUTES.
4. TURN IGNITION SWITCH TO "OFF" POSITION.
5. MOVE THROTTLE LEVER TO "OFF" POSITION.

MSC 3820

Figure 14. Stopping the engine.

- (2) Start the engine as outlined in *b* above. When pressing the starter button, activate the diesel engine ether starting aid as instructed in paragraph 22.

14. Stopping the Engine

15. Operating Details

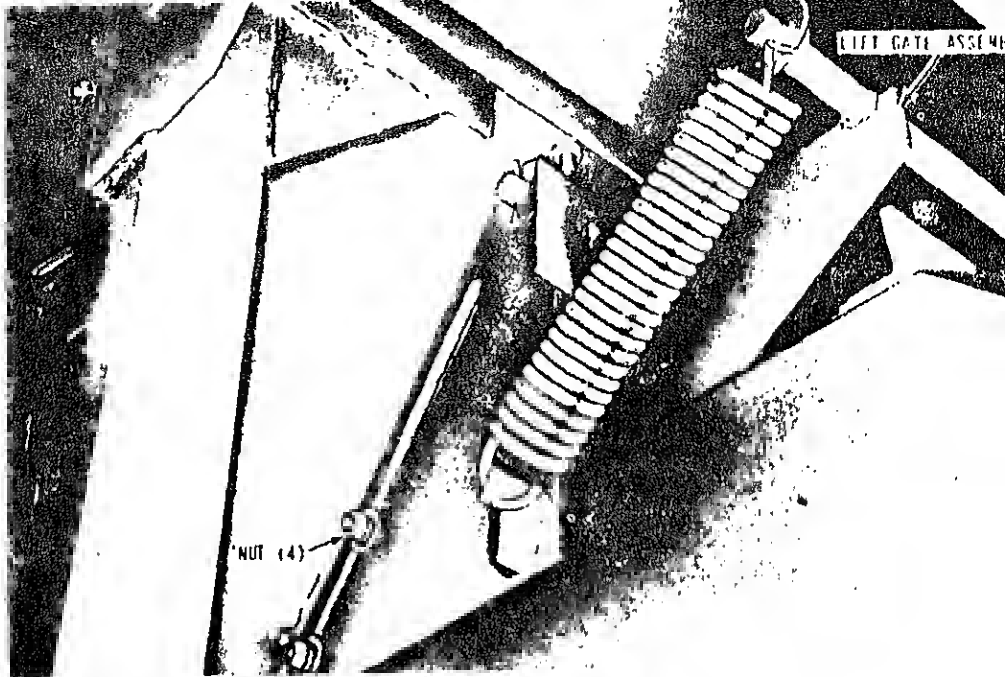
a. General. The operator must regulate flowing smoothly through the crusher (fig. 3) and not allow the material to build up or overflow from the conveyor vibrating screen, or crushing roller.



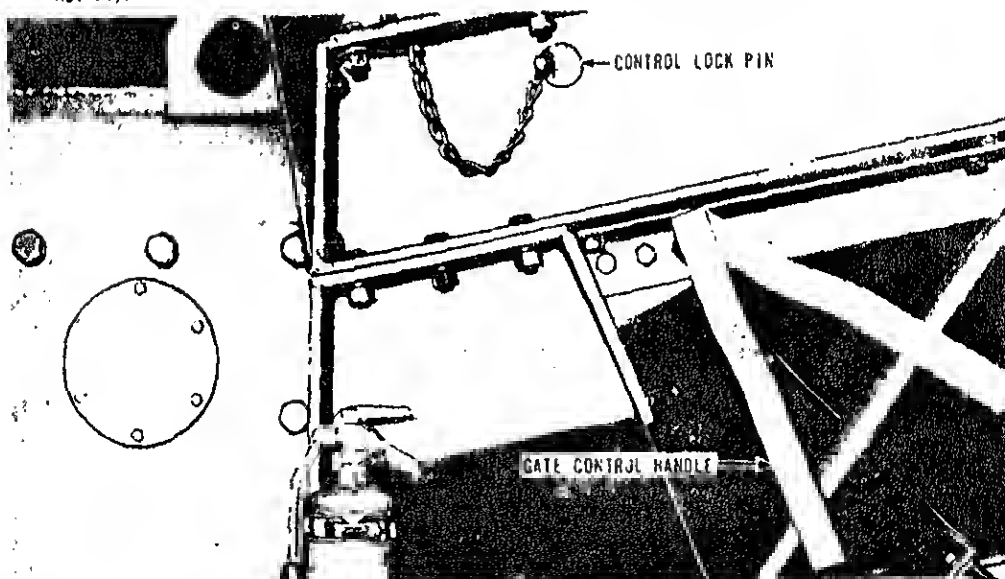
FEEDER RELIEF
CHUTE GATE

FEEDER RELIEF
CHUTE EXTENSION

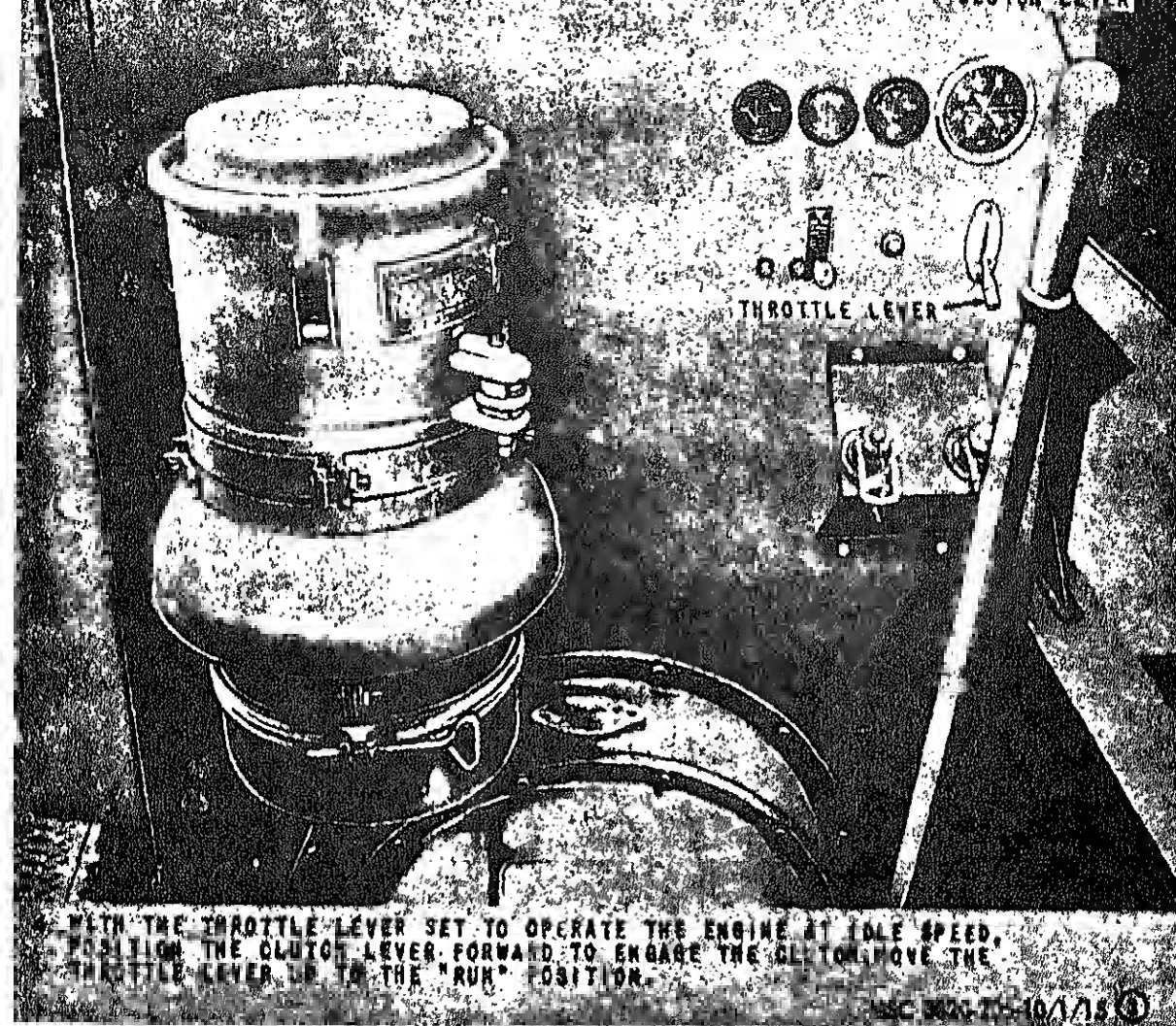
1. INSTALL A CONVEYOR UNDER THE FEEDER RELIEF CHUTE EXTENSION. OPEN THE FEEDER RELIEF CHUTE GATE TO OBTAIN AGGREGATE FROM THE FEEDER.



2. LOOSEN NUT (4). RAISE OR LOWER LIFT GATE ASSEMBLY TO OBTAIN DESIRED AGGREGATE FLOW FROM FEEDER HOPPER (FIG. 1).
NUT (4).



NOTE: MOVE THE GATE CONTROL HANDLE TO RIGHT TO DISCHARGE AGGREGATE FROM BOTH TOP AND BOTTOM VIBRATING SCREENS THROUGH THE UNDER HOPPER (FIG. 2). MOVE THE GATE CONTROL HANDLE TO LEFT TO DISCHARGE AGGREGATE SCREENED BY TOP VIBRATING SCREEN THROUGH THE LOWER CHUTE (FIG. 2), AND AGGREGATE SCREENED BY THE BOTTOM VIBRATING SCREEN THROUGH THE UNDER HOPPER (FIG. 2).



WITH THE THROTTLE LEVER SET TO OPERATE THE ENGINE AT IDLE SPEED, POSITION THE CLUTCH LEVER FORWARD TO ENGAGE THE CLUTCH. MOVE THE THROTTLE LEVER UP TO THE "RUN" POSITION.

NSC 302-75-10/1/15 ①

Figure 15—Continued.

capacity without overloading any of its components.

b. Operation.

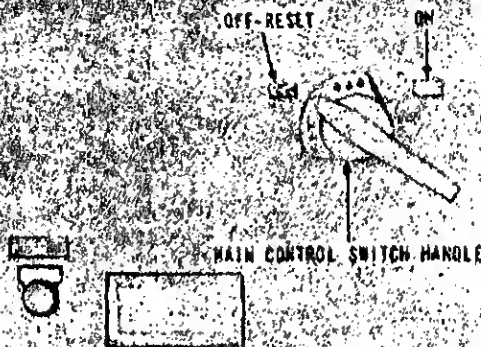
- (1) Start the engine (par. 13).
- (2) Make certain the vibrator screens are of the proper size for the desired grade of aggregate (par. 69).

in operation at operator's control box (6, fig. 15).

- (2) Move main control switch handle to OFF position (5, fig. 15).
- (3) Disengage engine clutch (4, fig. 15).
- (4) Stop the engine (par. 14).

14. Operation in Extreme Cold (Below 0°)

NOTE: BEFORE MOVING THE MAIN CONTROL SWITCH HANDLE TO 'ON' POSITION, OPEN THE CONTROL PANEL DOOR AND SEE THAT ALL CIRCUIT BREAKERS ARE IN THE 'ON' POSITION. CLOSE THE DOOR.



MOVE MAIN CONTROL SWITCH HANDLE TO 'ON' POSITION.

MSC 3820

Figure 15—Continued.

c. Keep batteries fully charged. After adding water to the batteries, run the engine for at least 1 hour.

d. Keep fuel tank full at all times.

e. Drain and service fuel filters frequently (par. 51).

f. Lubricate as specified in LO 5-3820-205-20/1-1.

g. Refer to paragraph 13c for cold temperature starting procedure. Start the engine and allow it to reach normal operating temperature.

all points of application. Check frequently.

b. *Cooling.* Make sure the radiator fins are clean and free of any foreign matter. Avoid the use of water containing oil or other substances that would cause corrosion or scale or rust.

c. *Engine.* If engine becomes overheated from lack of water, allow it to cool before adding water. Then add water in small amounts.

ROTARY ELEVATOR START BUTTON

RETURN (UNDER) CONVEYOR
START BUTTON.

VIBRATOR SCREEN
START BUTTON

RETURN (UNDER) CONVEYOR
STOP BUTTON

VIBRATOR SCREEN
STOP BUTTON

ROTARY ELEVATOR
STOP BUTTON

MAIN (FEED) CONVEYOR
START BUTTON

FEEDER START
BUTTON

MAIN (FEED) CONVEYOR
STOP BUTTON

EMERGENCY STOP BUTTON
(SAFETY CUTOFF SWITCH)

FEEDER STOP
BUTTON

GENERAL ELECTRIC
Control

6. PUSH START AND STOP BUTTONS TO CONTROL INDIVIDUAL ELECTRIC MOTORS FOR ROLL CRUSHER UNITS. SAFETY CUTOFF SWITCH IS FOR EMERGENCY ONLY.

MSC 3820-205-10/1/15 (5)

Figure 15—Continued.

18. Operation in Dusty or Sandy Areas

- a. *Lubrication.* Clean filters frequently. Clean lubrication points before applying lubricant. Lubricate in accordance with LO 5-3820-205-20/1-1.

while pouring. Service air cleaner frequently to remove sand and dust.

19. Operation Under Rainy or Humid Conditions.

- a. *Lubrication.* Lubricate in accordance with

avoid condensation. Service the fuel filters frequently (par. 51).

d. Protection. Cover the engine, electric motors, and controls with a tarpaulin or similar protection when not in use. Remove covers and open engine panels to allow unit to dry during dry periods before operation. Paint or coat with grease all exposed metal surfaces to prevent rusting:

e. Conveyors and Belts. Keep the scrapers adjusted and belts as clean as possible. Clean the conveyors and belts after each operation to prevent material from drying, caking, and building up on them.

20. Operation in Salt Water Areas

a. General. The deterioration and corrosion of exposed metal surfaces is greatly accelerated in saltwater areas. Paint all exposed nonpolished surfaces (TM 9-213). Coat exposed parts of polished steel and other ferrous materials with standard issue rustproofing material, if available, or cover parts with a light coat of grease.

b. Cooling. Be sure the water used in the cooling system is free of salt or alkali. Use an approved rust inhibitor to prevent the formation of rust or scale in the cooling system.

Section IV. OPERATION OF AUXILIARY MATERIEL USED IN CONJUNCTION WITH THE ROLL CRUSHER

22. Cold Weather Starting Aid

a. General. The pressure primers are used to supply ether to the diesel engine for starting in cold weather as low as -25° F. The ether is piped into the engine intake manifolds to aid combustion at lower temperatures and should never be used when the engine is warm.

b. Operating. Operate the pressure primers to aid in starting the diesel engine as instructed on figure 16.

after having used this expedient.

c. Fuel System. Keep the fuel system clean to eliminate condensation. Service frequently.

d. Electrical System. Keep the electrical system clean and dry. Wipe off oil and salt deposits. Pay particular attention to electrical connections. Inspect the generator frequently and remove dirt and moisture.

21. Operation at High Altitudes

a. The engine in this unit is designed to operate under normal conditions up to 5,000 feet above sea level without special adjustment.

b. Above 5,000 feet engine efficiency is reduced. This is a normal condition and cannot be prevented, but maximum efficiency can be maintained by following the instructions carefully. Be sure the unit is clean and free of objects that might restrict the flow of air to the unit.

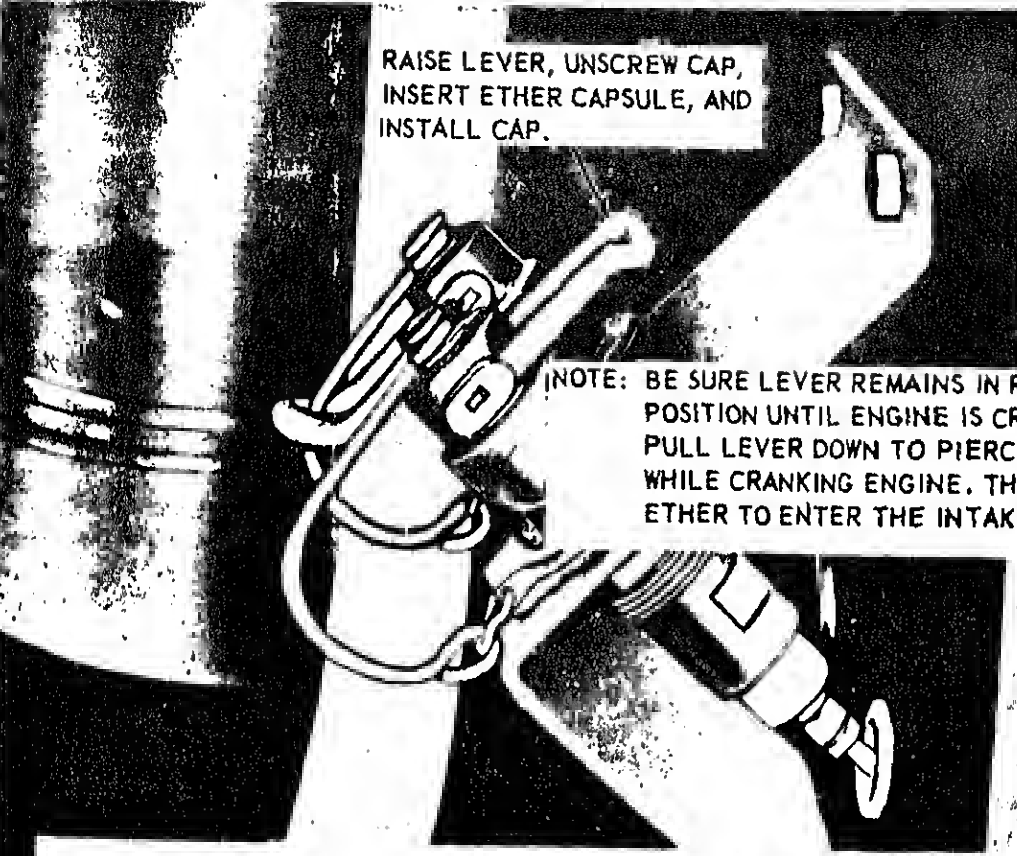
c. Be alert for radiator pressure. Do not allow the coolant to boil with excess pressure. Coolant. Inspect the radiator frequently for tight sealing.

23. Fire Extinguisher

(Carbon Dioxide Type)

a. Description. The carbon dioxide fire extinguisher is suitable for electrical and flammable liquid fires. The carbon dioxide is in the 5-pound size. The 5-pound size is portable.

b. Operation. Remove fire extinguisher to its location; break the seal, operate the handle, and direct the stream at the base of the fire.



RAISE LEVER, UNSCREW CAP,
INSERT ETHER CAPSULE, AND
INSTALL CAP.

NOTE: BE SURE LEVER REMAINS IN RAISED
POSITION UNTIL ENGINE IS CRANKED.
PULL LEVER DOWN TO PIERCE CAPSULE,
WHILE CRANKING ENGINE. THIS ALLOWS
ETHER TO ENTER THE INTAKE MANIFOLD.

WARNING: ETHER IS HIGHLY EXPLOSIVE AND TOXIC. HANDLE ETHER CAPSULES WITH
EXTREME CAUTION TO PREVENT RUPTURE UNTIL INSTALLED IN CAPSULE
CHAMBER, AND ENGINE IS BEING CRANKED.

NOTE: ON UNITS OF EQUIPMENT WITHIN SERIAL NUMBER RANGE 6590 THROUGH 6629 THE
ETHER STARTING AIDS ARE LOCATED ONE ABOVE THE OTHER.

MSC 3820-205-10/1/16

Figure 16. Pressure primer instructions.

CHAPTER 3

MAINTENANCE INSTRUCTIONS

Section I. OPERATOR'S TOOLS AND EQUIPMENT

24. Special Tools and Equipment

No special tools or equipment is required by the operator for the maintenance of this roll crusher.

25. Basic Issue Tools and Equipment

Tools and repair parts issued with the roll crusher are listed in the items list, appendix II of this manual.

Section II. LUBRICATION

26. General Lubrication Information

a. This section contains a reproduction of the lubrication order and lubrication instructions which are supplemental to and not specifically covered in the lubrication order.

b. The lubrication order shown on figure 17 is an exact reproduction of the approved lubrication order for the roll crusher. For the current lubrication order, always refer to DA Pam 310-4.

27. Detailed Lubrication Information

a. Care of Lubricants.

(1) *General.* The primary function of a lubricant is to decrease the rate of wear, and to maintain the efficiency of a machine, by reducing friction between the moving parts and by dissipating frictional heat. If a lubricant is contaminated with dust, dirt, or water, it cannot perform its function. Every precaution must be taken to protect lubricants from contamination.

(2) *Storage.* Keep all lubricants and lubrication equipment in airtight containers. Lubricants should be stored in a cool, dry place.

(3) *Handling.* Whenever possible, lubrication operations should be done in a clean place. Clean the oil cans and containers before they are used. Protect them from dust. When covers are removed, clean the equipment with approved cleaning solvent and carefully dry before and after use.

b. *Points of Application.* Follow the instructions for each lubrication point listed in LO 5-3820-205-20/1-1 (figure 17). Apply the proper lubricant as indicated.

Note. Before lubrication, clean all lubrication points, and areas around these points with approved cleaning solvent. Do not use gasoline for this purpose. Dry thoroughly with lint-free cloth before applying lubricants. Reclean after lubrication.

c. OES Lubricating Oil.

(1) The crankcase oil level should be checked frequently as oil consumption may increase.

(2) The oil may require changing frequently because of contamination and sludge formation. Oil viscosity may increase during cold weather operation.

d. Oil Filter Assembly.

CRUSHER, ROLL: DIESEL AND ELECTRIC DRIVEN; WHEEL MOUNTED, PNEUMATIC TIRES; 75 TON PER HOUR (EAGLE CRUSHER MODEL 5230B) W/ENGINE, CONTINENTAL MODEL SD 802

Reference: LG S-3870-205-70/1-2 and -3, SM 10-1-C4-1

Intervals are based on normal hours of operations. Reduce to compensate for abnormal operations and severe conditions. During inactive periods, sufficient lubrication must be performed for adequate preservation.

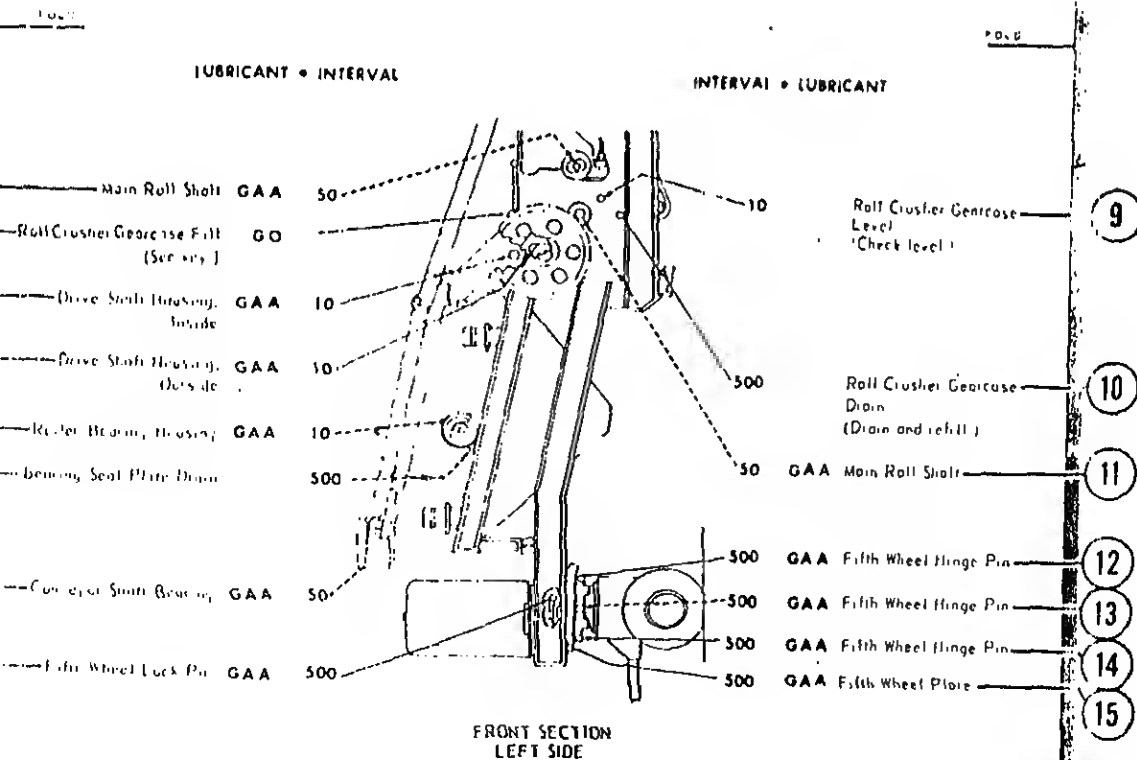
Clean fittings before lubricating.

Relubricate after washing or hosing.

Clean parts with SOLVENT, dry-cleaning, or with OIL, fuel, Diesel. Dry before lubricating.

Lubricate points indicated by dotted arrow shafts on both sides of equipment.

Drain gearcase when hot. Fill and check level.



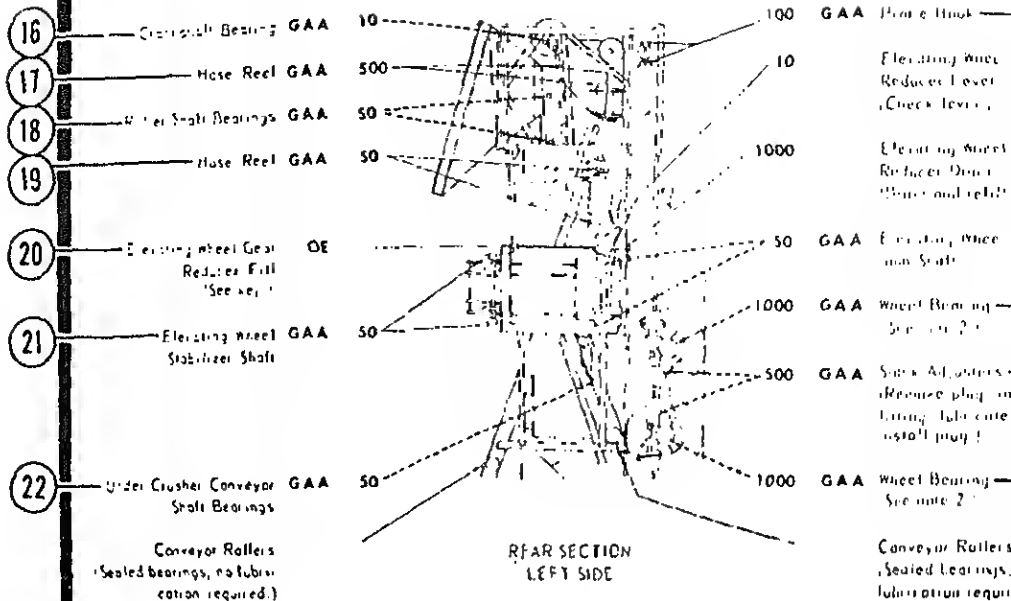


FIG. 2

- KEY -

LUBRICANTS	CAPACITY	EXPECTED TEMPERATURES			INTERVAL
		Above +32°F	+40°F to -10°F	0°F to -65°F	
OE - OIL, Engine, Heavy Duty		OE 30	OE 10	OE 5	Inter
Oil Can Points		9250	9110		oper
Elevating Wheel Gear Reducer	7qt				in ha
OE 5 - OIL, Engine, Sub-zero					not
GO - LUBRICATING OIL, Gear					oper
Roll Crushers Grease	23qt	GO 140	GO 45	GO 5	
GOS - LUBRICATING OIL, Gear, Sub-zero					
GAA - GREASE, Automotive and Artillery					

All Temperatures

NOTES

1. FOR OPERATION OF EQUIPMENT IN PROTRACTED COLD TEMPERATURES BELOW -10°F. Remove lubricants prescribed in the key for temperatures above -10°F. Clean parts with SOLVENT, dry, cleaning. Relubricate with lubricants specified in the key for temperatures below -10°F.

2. WHEEL BEARINGS. Every 1000 hours remove wheels, clean and inspect oil parts, replace damaged or worn parts, repack bearings, and reassemble.

3. OIL CAN POINTS. Every 50 hours lubricate linkage pins, clevises, and all exposed adjusting threads with OE, including leveling jacks as needed.

Copy of this Lubrication Order will remain with the at all times, instructions contained herein are mandatory.

BY ORDER OF THE SECRETARY OF THE ARMY

G. H. DECKER
General, United States Army
Chief of Staff

OFFICIAL
J. C. LAMBERT,
Major General, United States Army,
The Adjutant General.

CRUSHER, ROLL: DIESEL AND ELECTRIC DRIVEN; WHEEL MOUNTED, PNEUMATIC TIRES; 75 TON PER HOUR (EAGLE CRUSHER MODEL S230B) W/ENGINE CONTINENTAL MODEL SD 802

References: L.O. 5-3820-205-20/1-1 and -3, TM 5-3820-205-10/1, C 9100-SL

Intervals are based on normal hours of operations. Reduce to compensate for abnormal operations and severe conditions. During inactive periods sufficient lubrication must be performed for adequate preservation.

Clean parts with SOLVENT, dry-cleaning, or with OIL, fuel, Diesel. Dry before lubricating.

Lubricate points indicated by dotted arrow shafts on both sides of equipment.

Clean fittings before lubricating.

Relubricate after washing or folding.

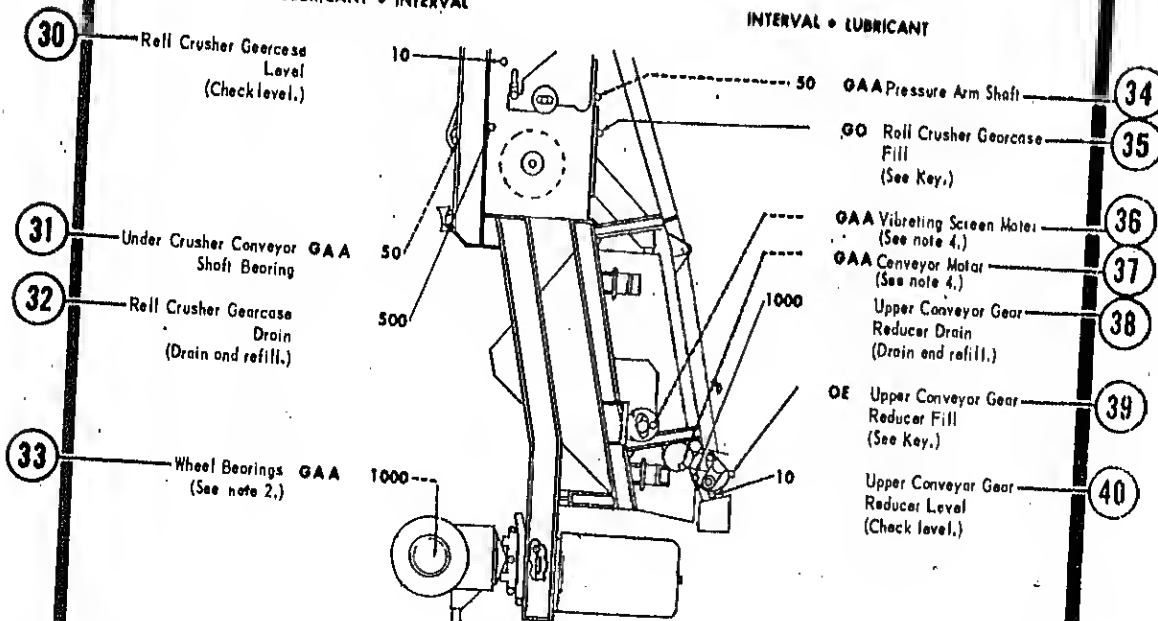
Drain gearcase when hot. Fill and check level.

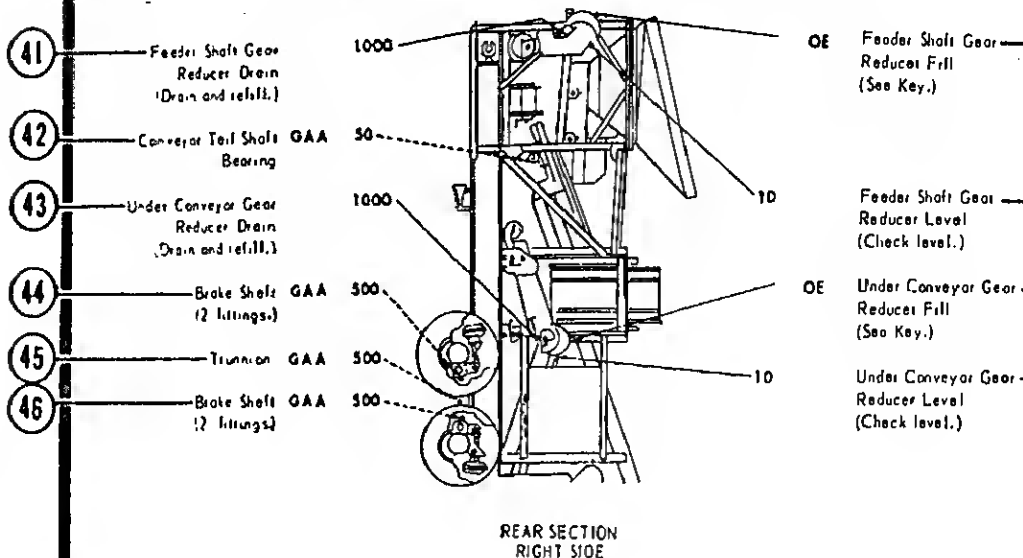
FOLD

FOLD

LUBRICANT • INTERVAL

INTERVAL • LUBRICANT





- KEY -

		- R17 -					
LUBRICANTS	CAPACITY	EXPECTED TEMPERATURES			INTERVALS		
		Above +32°F	+40°F to -10°F	0°F to -65°F			
OE - OIL, Engine, Heavy Duty		OE 30 or 9250	OE 10 or 9110	OES	Intervals given are in hours of normal operation.		
Oil Can Points							
Upper Conveyor Gear Reducer	5 qt						
Under Conveyor Gear Reducer	4 qt						
Feeder Shaft Gear Reducer	2 qt						
OES - OIL, Engine, Sub-zero		GO 140	GO 90	GOS			
GO - LUBRICATING OIL, Gear							
Roll Crusher Gearcase	50 qt						
GOS - LUBRICATING OIL, Gear, Sub-zero		All Temperatures					
GAA - GREASE, Automotive and Artillery							
NOTES							

NOTES

1. FOR OPERATION OF EQUIPMENT IN PROTRACTED COLD TEMPERATURES BELOW -10°F. Remove lubricants prescribed in the key for temperatures above -10°F. Clean parts with SOLVENT, dry-cleaning. Relubricate with lubricants specified in the key for temperatures below -10°F.

2. WHEEL BEARINGS. Every 1000 hours remove wheels, clean and inspect all parts, replace damaged or worn parts, repack bearings, and reassemble.

3. OIL CAN POINTS. Every 50 hours lubricate linkage pins, clevises, and all exposed adjusting threads with OE, including leveling jacks as needed.

4. ALL MOTOR BEARINGS. Remove fittings, install plugs, be lubricated only at time of disassembly by 3rd echelon.

Copy of this Lubrication Order will remain with the equipment at all times; instructions contained herein are mandatory.

BY ORDER OF THE SECRETARY OF THE ARMY:

EARLE G. WHEELER,
General, United States Army
Chief of Staff.

OFFICIAL:

J. C. LAMBERT,
Major General, United States Army

CRUSHER, ROLL: DIESEL AND ELECTRIC DRIVEN; WHEEL MOUNTED, PNEUMATIC TIRES; 75 TON PER HOUR (EAGLE CRUSHER MODEL S230B) W/ENGINE CONTINENTAL MODEL SD 802

Reference: LO 5-3820-205-20/1-1 and -2, SM 10-1-C4-1

Intervals are based on normal hours of operations. Reduce to compensate for abnormal operations and severe conditions. During inactive periods sufficient lubrication must be performed for adequate preservation.

Clean fittings before lubricating.

Relubricate after washing or farding.

Clean parts with SOLVENT, dry-cleaning, or with OIL, fuel, Diesel. Dry before lubricating.

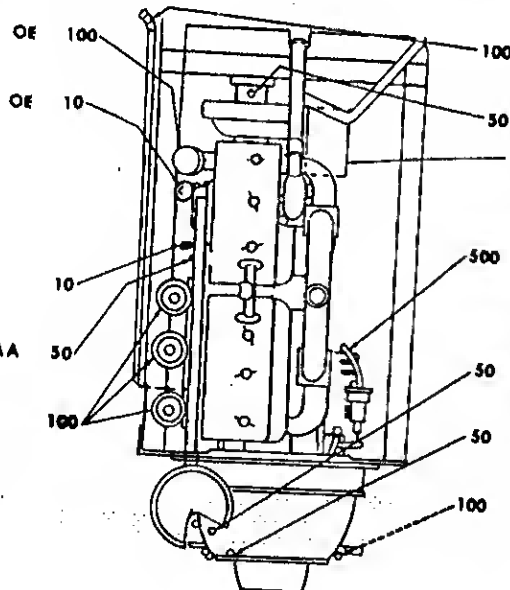
Lubricate points indicated by dotted arrow shafts on both sides of equipment.

Drain crankcase only when hot after operation; replenish and check level when cool.

LUBRICANT • INTERVAL

INTERVAL • LUBRICANT

- 51 — Crankcase Fill (See Key.)
- 52 — Crankcase Breather (Refill oil reservoir to level mark; every 50 hours disassemble entire unit, clean, re-oil, and reassemble.) (See Key.) (See Note 3.)
- 53 — Crankcase Level Gage (Check level.)
- 54 — Tachometer Drive (Sparingly)
- 55 — Oil Filter (Disassemble, clean housings, renew elements, and reassemble.) (See Note 2.)



- 56 — Crankcase Drain (Drain and refill.)
- 57 — GAA Water Pump
- 58 — Generator (Sealed bearings; no lubrication required.)
- 59 — OE Starter (Sparingly)
- 60 — GAA Clutch Throwout Bearing (Sparingly)
- 61 — GAA Clutch Shaft Bearing (Sparingly)
- 62 — GAA Clutch Release Shaft

LUBRICANTS	CAPACITY	EXPECTED TEMPERATURES			INTERVAL
		Above +32°F	+40°F to -10°F	0°F to -65°F	
OE - OIL, Engine, Heavy Duty		OE 30 or 9250	OE 10 or 9110	OES	Interval given or in hours normal operation
Crankcase	24 qt				
Oil Can Points					
OES - OIL, Engine, Sub-zero		All Temperatures			
GAA - GREASE, Automotive and Artillery					

NOTES

1. FOR OPERATION OF EQUIPMENT IN PROTRACTED COLD TEMPERATURES BELOW -10°F. Remove lubricants prescribed in the key for temperatures above -10°F. Clean parts with SOLVENT, dry-cleaning. Relubricate with lubricants specified in the key for temperatures below -10°F.

2. OIL FILTERS. After installing new filter elements, fill crankcase, operate engine 5 minutes, check housing for leaks, check crankcase level, and bring to full mark.

3. OIL CAN POINTS. Every 50 hours lubricate throttle and governor linkage, pins and clevises. Fill crankcase breather to level mark with OE.

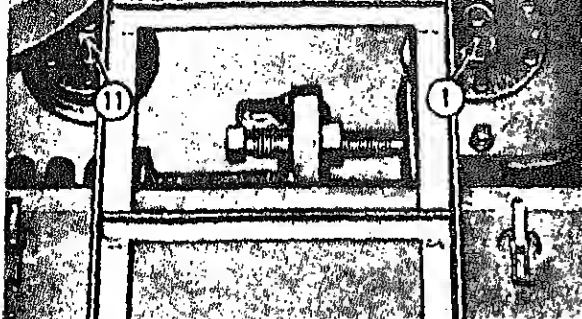
Copy of this Lubrication Order will remain with the equipment at all times, instructions contained herein are mandatory.

BY ORDER OF THE SECRETARY OF THE ARMY:

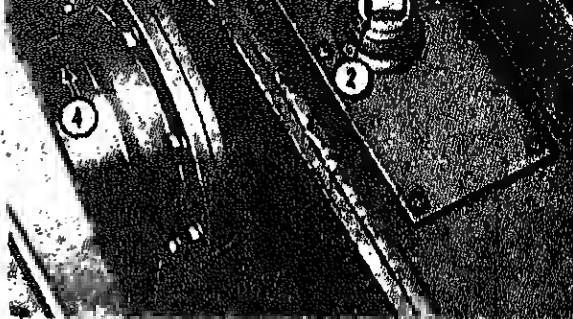
G. H. DECKER,
General, United States Army
Chief of Staff.

OFFICIAL:

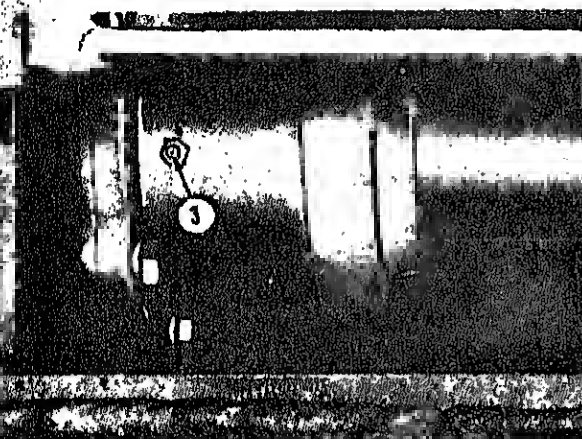
R. V. LEE,
Major General, United States Army,
The Adjutant General.



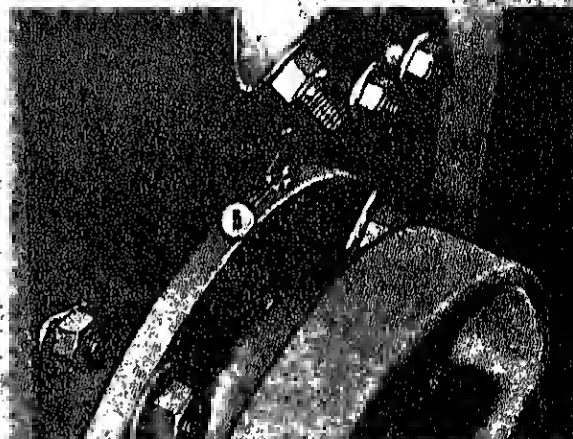
REF. 1 MAIN ROLL SHAFT
REF. 11 MAIN ROLL SHAFT



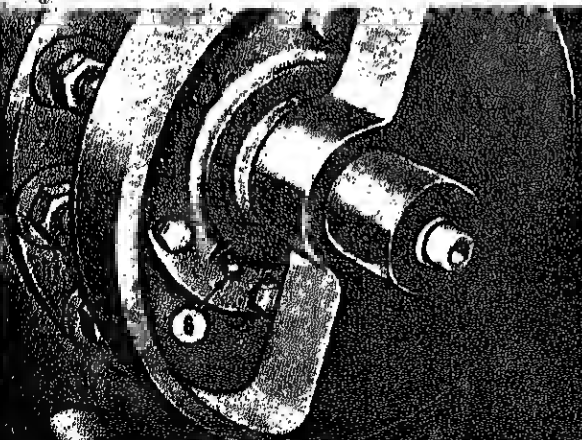
REF. 2 ROLL CRUSHER GEARCASE FILL
REF. 4 DRIVE SHAFT HOUSING, OUTSIDE



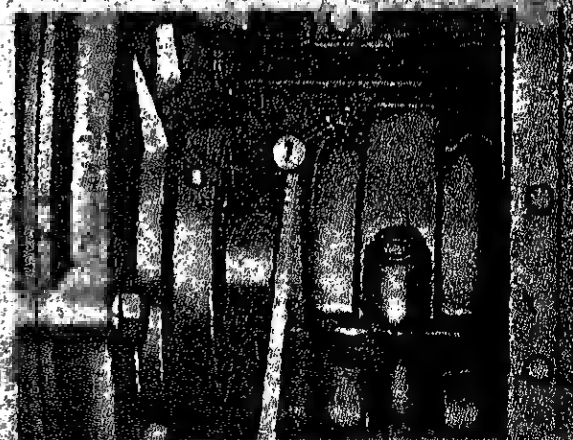
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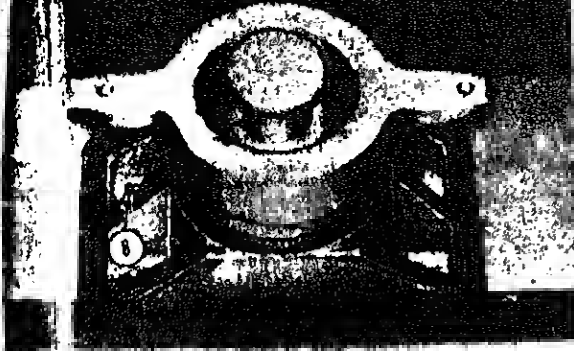
REF. 5 ROLLER BEARING HOUSING



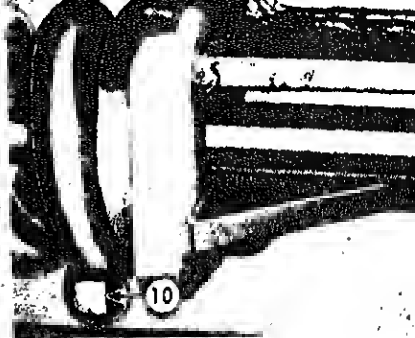
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REF. 7 CONVEYOR SHAFT BEARING

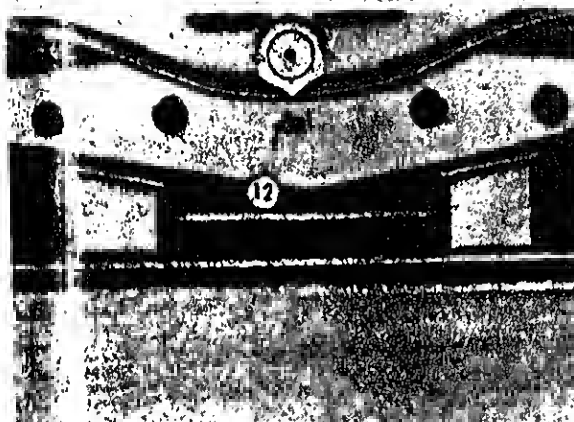


REF. 8 FIFTH WHEEL LOCK PIN

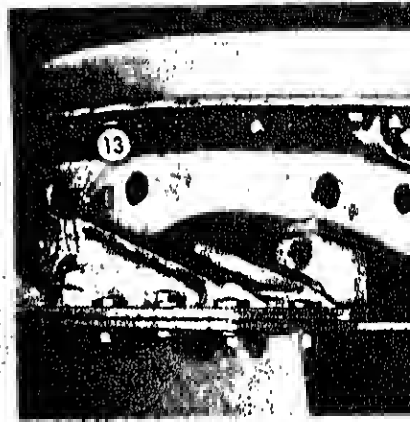


REF. 8 ROLL CRUSHER GEARCASE LEVEL

REF. 10 ROLL CRUSHER GEARCASE DRAIN



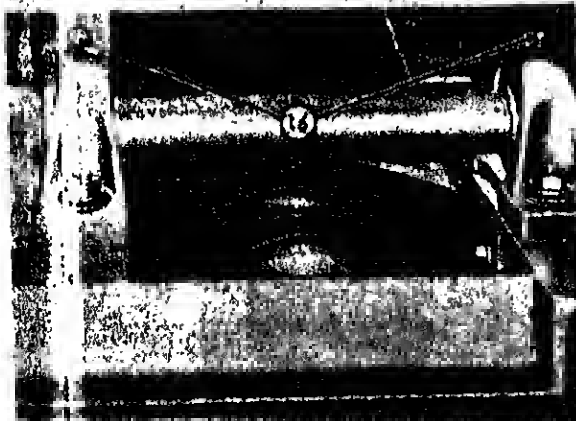
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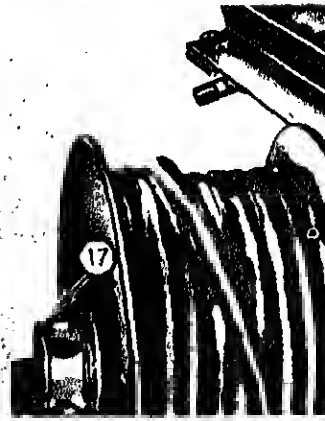
REF. 13 FIFTH WHEEL HINGE PIN

REF. 14 FIFTH WHEEL HINGE PIN

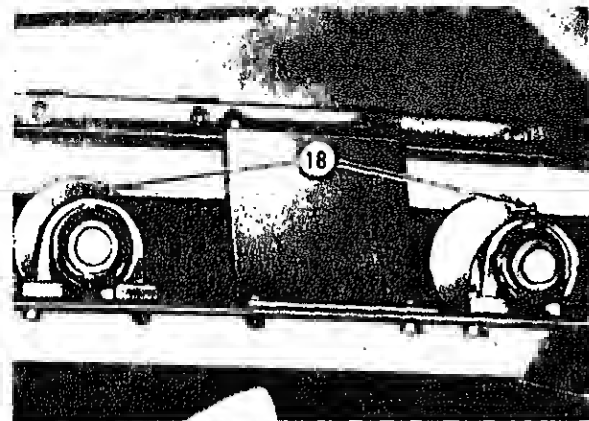
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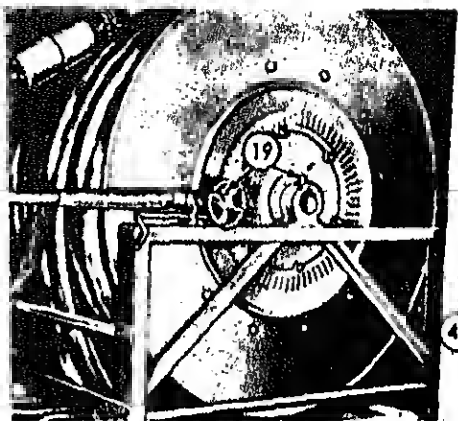
REF. 16 CRANE SHAFT BEARING



REF. 17 NOSE REEL



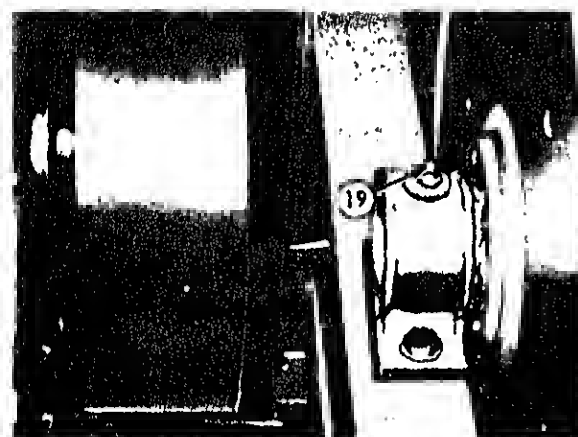
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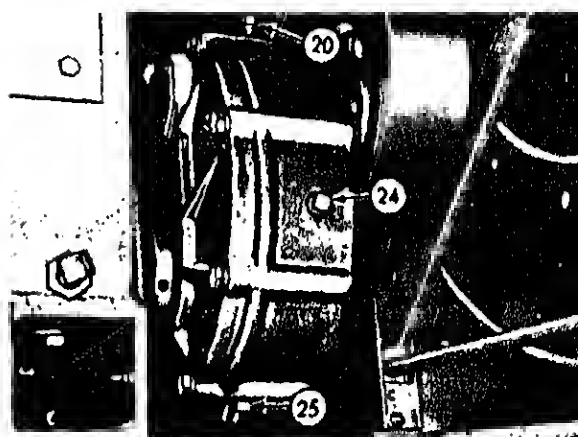
REF. 19 HOSE REEL



REF. 42 CONVEYOR TAIL SHAFT BEARING



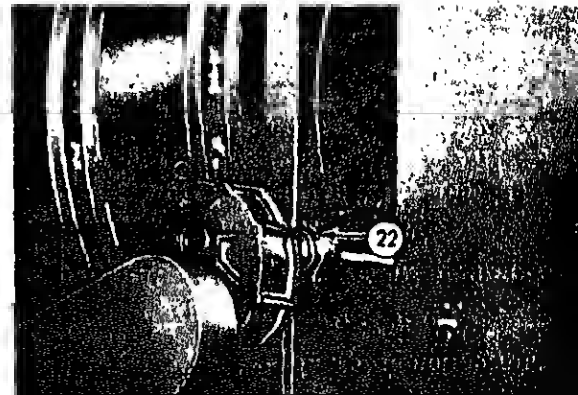
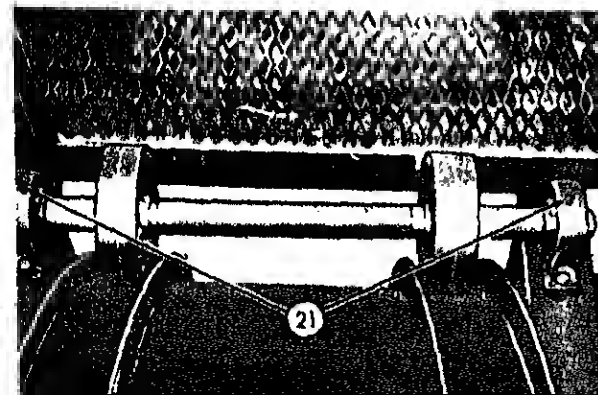
REF. 19 HOSE REEL



REF. 20 ELEVATING WHEEL GEAR REDUCER FILL

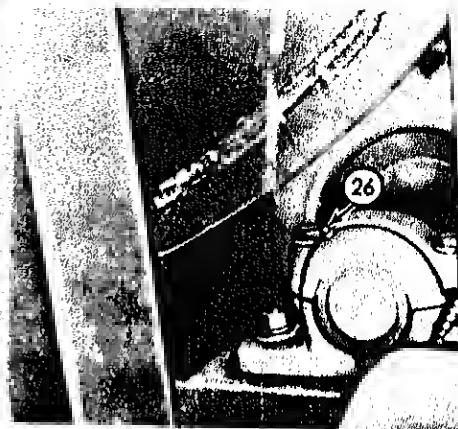
REF. 24 ELEVATING WHEEL GEAR REDUCER LEVEL

REF. 25 ELEVATING WHEEL GEAR REDUCER DRAIN

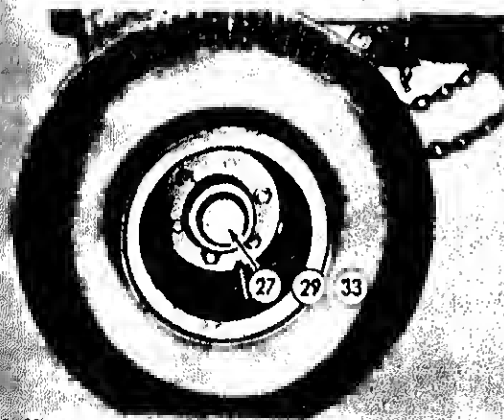




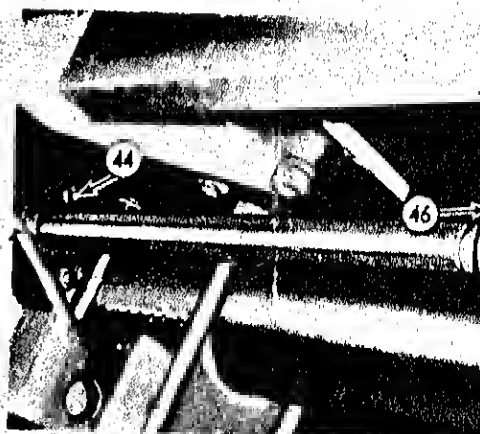
REF. 23 PINTLE HOOK



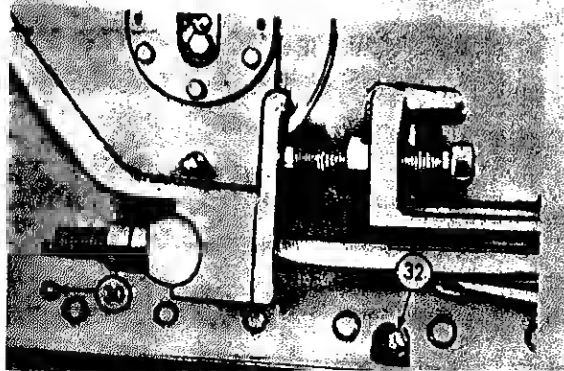
REF. 26 ELEVATING WHEEL TRUNNION SHAFT

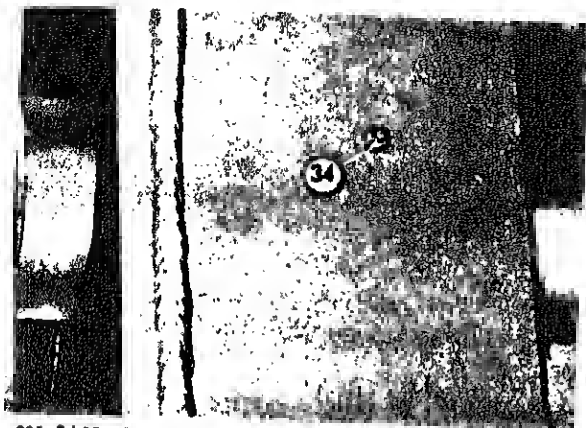


REF. 27 WHEEL BEARING
REF. 29 WHEEL BEARING
REF. 33 WHEEL BEARINGS

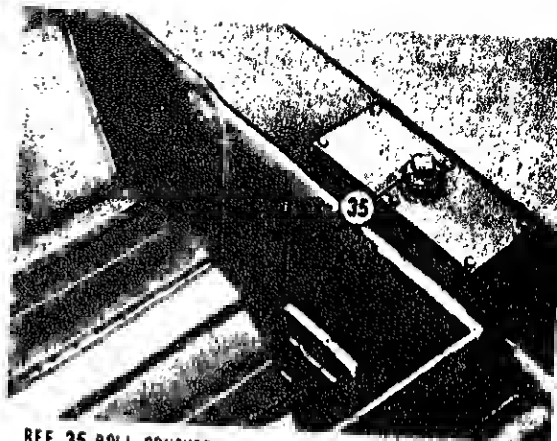


REF. 28 SLACK ADJUSTERS
REF. 44 BRAKE SHAFT
REF. 46 BRAKE SHAFT

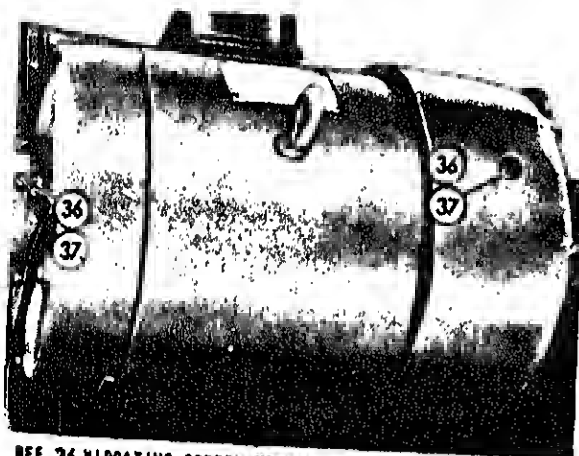




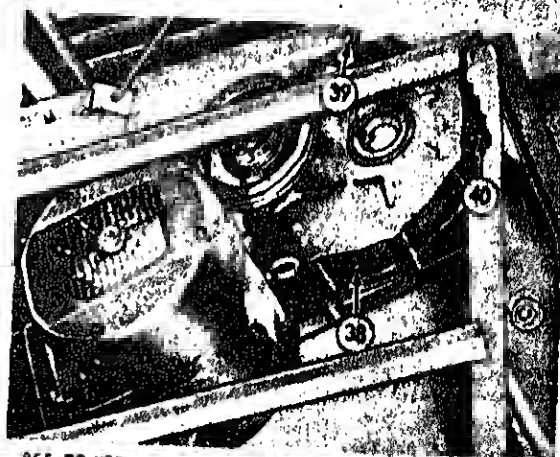
REF. 34 PRESSURE ARM SHAFT



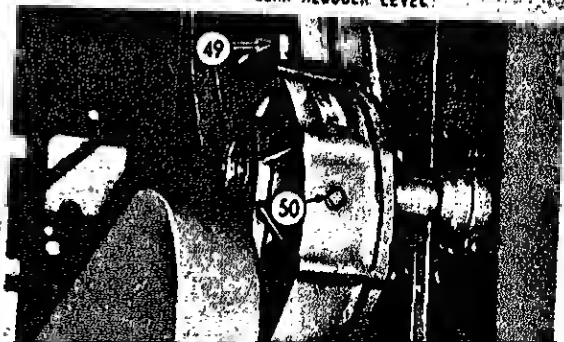
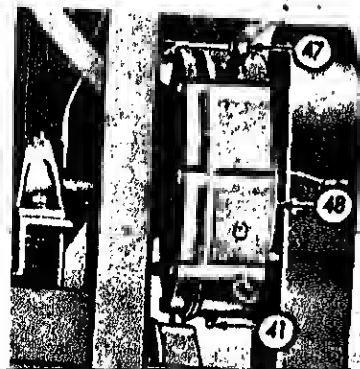
REF. 35 ROLL CRUSHER GEARCASE FILL

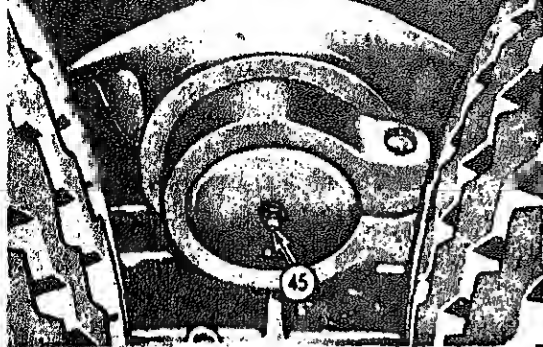


REF. 36 VIBRATING SCREEN MOTOR
REF. 37 CONVEYOR MOTOR

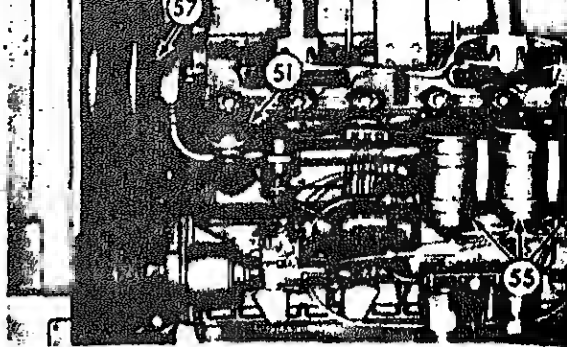


REF. 38 UPPER CONVEYOR GEAR REDUCER DRAIN
REF. 39 UPPER CONVEYOR GEAR REDUCER FILL
REF. 40 UPPER CONVEYOR GEAR REDUCER LEVEL





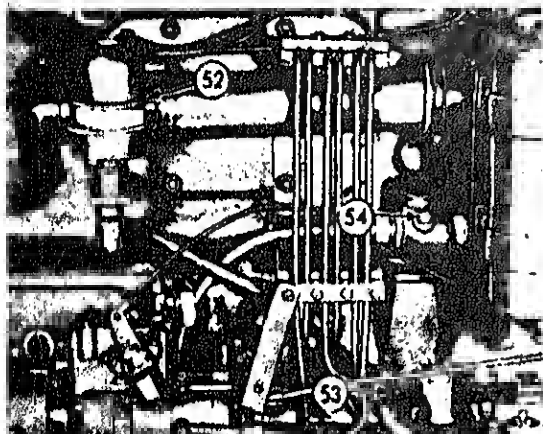
REF 45 TRUNNION



REF 51 CRANKCASE FILL

REF 55 OIL FILTER

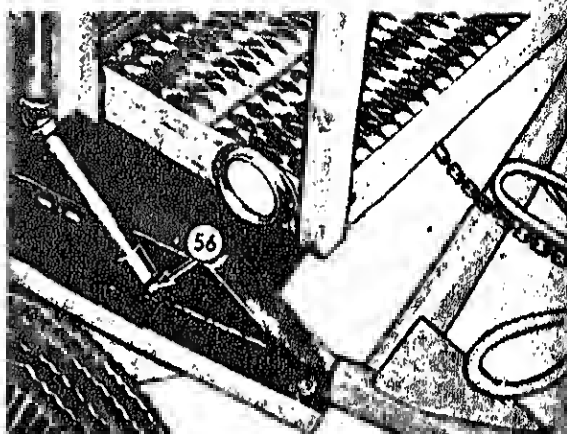
REF 57 WATER PUMP



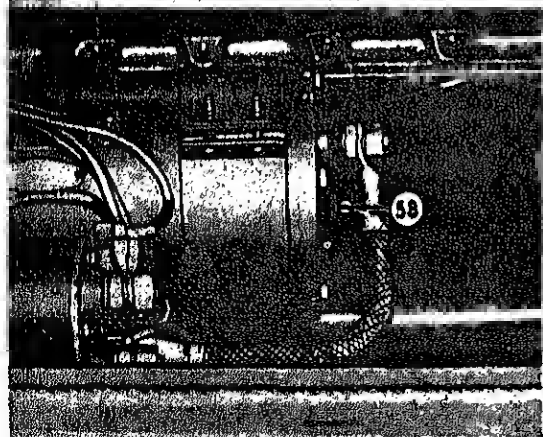
REF 52 CRANKCASE BREATHER

REF 54 CRANKCASE LEVEL GAGE

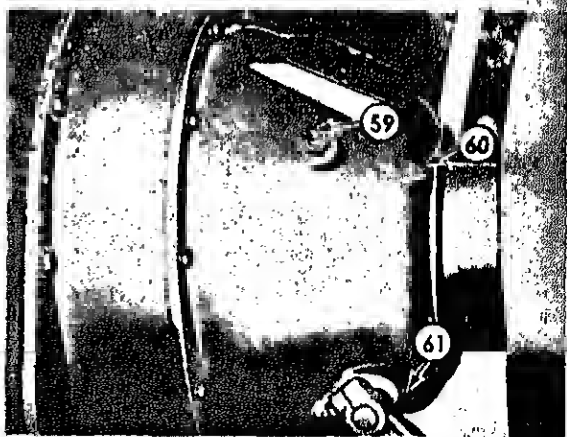
REF 53 TACHOMETER DRIVE



REF 56 CRANKCASE DRAIN



REF 58 STARTER

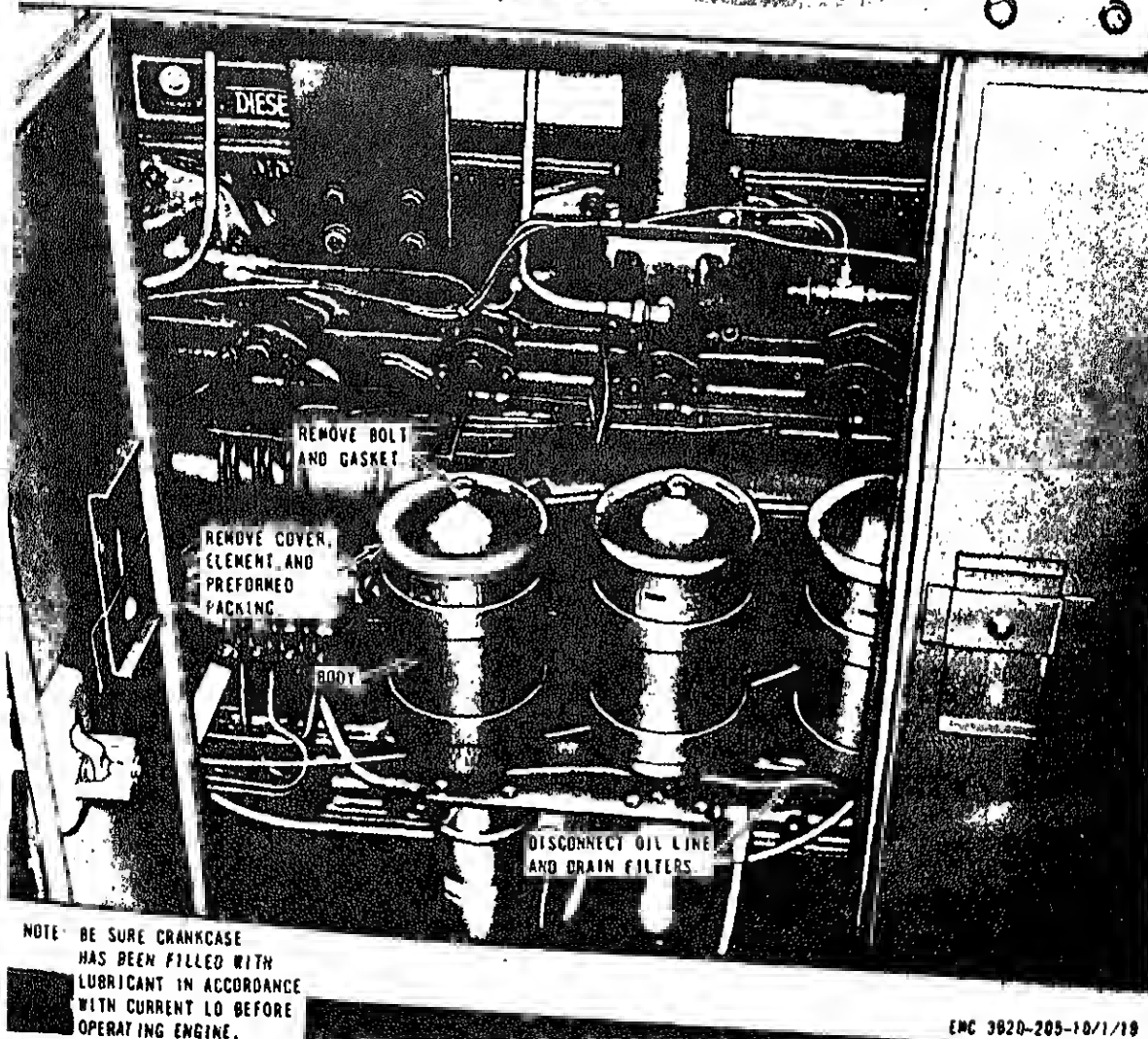


REF 59 CLUTCH THROWOUT BEARING

REF 60 CLUTCH DISC BEARING

NOTE: SERVICE THE REMAINING
FILTERS IN A SIMILAR
MANNER.

NOTE: CLEAN COVER AND BODY.
REPLACE ELEMENT AND
PERFORMED PACKING.
OPERATE ENGINE AND
CHECK FOR LEAKS.



EMC 3820-205-10/1/10

Figure 18. Oil filter assemblies service

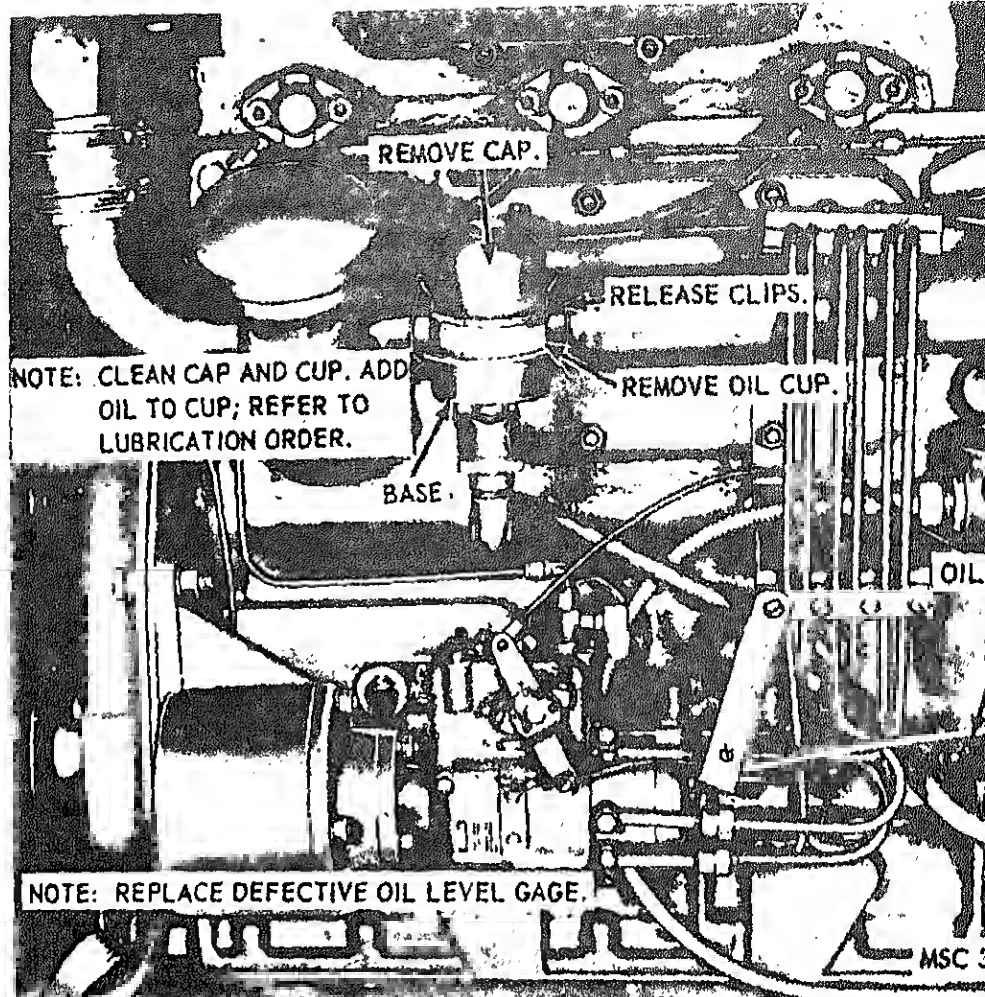


Figure 19. Crankcase breather service.

Section III. PREVENTIVE MAINTENANCE SERVICES

28. General

To insure that the roll crusher is ready for operation at all times, it must be inspected systematically, so that defects may be discovered and corrected before they result in serious damage or failure. The necessary preventive maintenance services to be performed are listed and

would damage the equipment if continued. All deficiencies and action taken on DA Form 2, Inspection and Maintenance Worksheet, at the earliest possible opportunity.

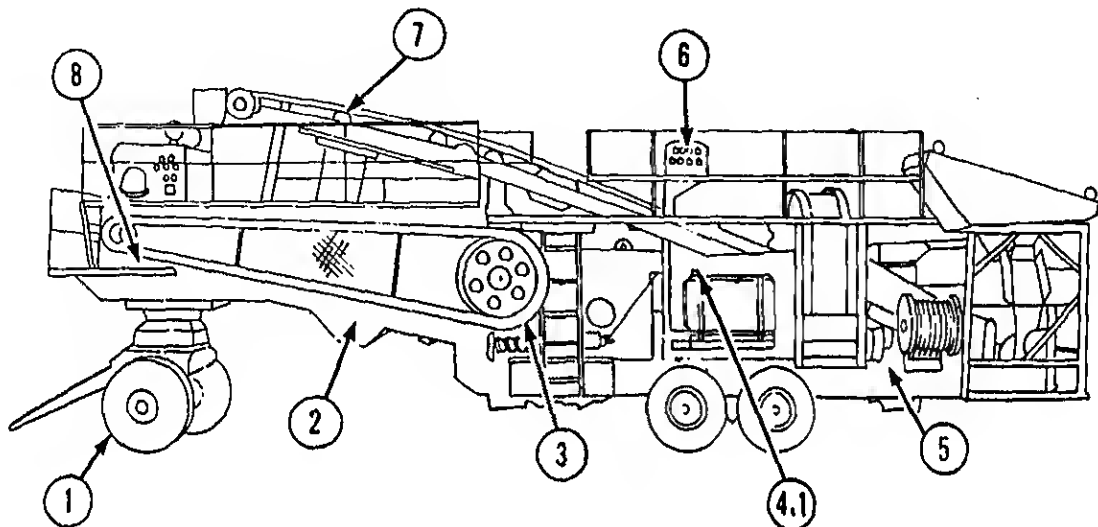
29. Daily Preventive Maintenance

DAILY

TM 5-3820-205-10/1

EAGLE MODEL 5230B

ROLL CRUSHER



LUBRICATE IN ACCORDANCE WITH CURRENT LUBRICATION ORDER

ITEM

PAR. REF

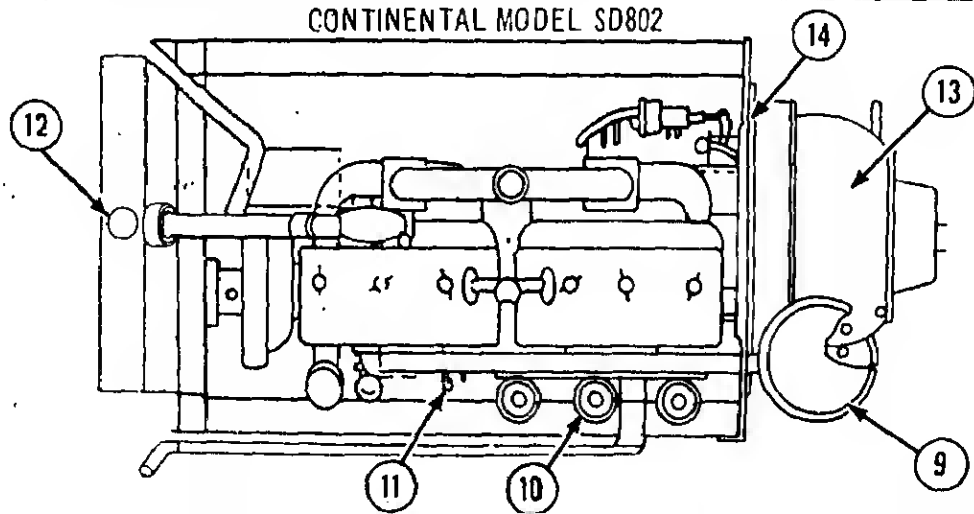
1 TIRES. Perform visual check for proper inflation. Correct air pressure is 100 psi.

2 HOPPER AND CHUTES. Check for proper operation. Check liners for excessive wear. Check deflectors for wear and proper adjustment. When hopper is loaded, deflectors should barely touch conveyor belt. (Weekly)

3 FIRE EXTINGUISHER. Inspect for broken seal.

4.1	<u>FUEL TANK.</u> Check level. Drain sediment from tank. (Biweekly).	
5	<u>AIR SYSTEM.</u> Drain condensation from reservoir and filters after use.	
6	<p><u>OPERATOR'S ELECTRICAL CONTROL BOX.</u> Check for proper operation. Make sure switches are in correct positions and cables are connected. Make sure ground rod is securely mounted and there are no loose connections. Check for tightly sealed box.</p> <p>WARNING: Do not connect electrical power or operate the equipment if the ground connection is not properly installed. Death by electrocution could result from contacting ungrounded equipment should some electrical fault develop in power equipment or lines.</p>	
7	<u>CONVEYOR BELT ASSEMBLIES.</u> Check for excessive wear, frayed condition, proper adjustment, and alignment. Conveyor belt should be adjusted just enough to prevent slipping when loaded. Check rollers for excessive wear, material buildup, and defective bearings. Check belt scrapers for excessive wear and proper adjustment. Adjust belt scrapers so they barely touch conveyor belt. (Weekly)	
8	<u>BATTERIES.</u> Check electrolyte level and hand tightness of connections. Fill to 3/8 inch above filler plates. In freezing weather run the engine one hour after adding water. (Weekly)	

CONTINENTAL MODEL SD802



9	<u>AIR CLEANER.</u> Check to see if red signal is visible.	
10	<u>PRIMARY FUEL FILTER.</u> Drain sediment. (Weekly)	51
11	<u>ENGINE OIL LEVEL.</u> Check oil level. Add oil to proper level.	
12	<u>RADIATOR.</u> Check coolant level. Fill to 2 inches below filler neck.	
13	<u>MASTER CLUTCH.</u> Check for proper operation.	
14	<u>CONTROLS AND INSTRUMENTS.</u> Normal readings are: Coolant temperature 165°F to 185°F. Engine oil pressure 55 to 65 psi Battery-generator indicator Green Range Tachometer 1,400 RPM	
	<u>NOTE: OPERATION.</u> During operation check all controls for proper operation.	

30. General

This section provides information useful in diagnosing and correcting unsatisfactory operation or failure of the roll crusher and its components. Each trouble symptom stated is

followed by a list of probable causes of the trouble. The possible remedy recommended is described opposite the probable cause. Any operational trouble that is beyond the scope of the operator or crew must be reported to organizational maintenance.

31. Engine Hard To Start, or Fails To Start

<i>Probable cause</i>	<i>Possible remedy</i>
Atmospheric temperature low	Use ether starting aids (par. 22).
No fuel in tank	Fill the fuel tank (par. 54).
Dirt, gum, or water in fuel lines or tank	Service the fuel tank (par. 54).
Air trapped in fuel lines	Bleed fuel line (par. 52).
Fuel filters clogged	Clean the primary fuel filter element (par. 51). Replace the secondary fuel filter element (par. 51).
Throttle lever not in the start position	Place throttle lever in the start position.
Cranking speed too low	Report this condition to organizational maintenance.

32. Engine Operates Erratically or Lacks Power

<i>Probable cause</i>	<i>Possible remedy</i>
Dirt, gum, or water in fuel	Service fuel tank and lines and fill with clean fuel (par. 54).
Air cleaner clogged	Service air cleaner (par. 53).
Fuel filters clogged	Clean the primary fuel filter element (par. 51). Replace the secondary fuel filter element (par. 51).
Air in the fuel system	Bleed fuel lines (par. 52).

33. Exhaust Smokes Excessively

<i>Probable cause</i>	<i>Possible remedy</i>
Crankcase oil level too high	Drain oil until proper level is obtained (LO 5-3820 205-20/1-1).
Engine cold causing poor combustion	Report this condition to organizational maintenance.
Engine overloaded	Reduce load on engine.
Air cleaner clogged	Service air cleaner (par. 53).

34. Engine Overheats

<i>Probable cause</i>	<i>Possible remedy</i>
Coolant level low	Fill radiator to proper level (par. 56).
Fan belts loose	Tighten fan belts (par. 57).
Exhaust restricted	Remove restriction or report to organizational maintenance.
Engine overloaded	Reduce load on engine.
Water pump faulty	Report this condition to organizational maintenance.

35. Engine Knocks or Develops Unusual Noise

<i>Probable cause</i>	<i>Possible remedy</i>
Accessory mountings loose	Tighten mountings or report to organizational maintenance.
Crankcase oil supply low	Stop engine and check oil supply. Replenish oil.

<i>Probable cause</i>	<i>Possible remedy</i>
Air trapped in fuel lines.....	Bleed fuel lines (par. 52).
Engine overheated (safety control operated).....	Inspect the coolant level (par. 56), and fan belt adjustment (par. 57), and radiator for obstructions.
Restriction in air intake.....	Service the air cleaner (par. 53).
Oil pressure low (safety control operated).....	Check the oil level in the crankcase. Replenish if low. (LO 5-3820-205-20/1-1).

37. Conveyor Does Not Run Properly or Will Not Run

<i>Probable cause</i>	<i>Possible remedy</i>
Too much slack in drive belts.....	Adjust conveyor drive belts (pars. 70 and 761).
Circuit breaker tripped.....	Correct the cause of overload and reset the circuit breaker.
Grease on drive sheave or belt.....	Clean grease off belt or drive sheave with appropriate cleaning solvent.

38. Crusher Rolls Do Not Turn or Come Up To Normal Speed

<i>Probable cause</i>	<i>Possible remedy</i>
Roll drive belts slipping due to dirt or grease on belts and pulleys.....	Clean crusher rolls drive belts and pulley.
Engine clutch slips.....	Adjust clutch (par. 63).

39. Screen Vibrates Excessively

<i>Probable cause</i>	<i>Possible remedy</i>
Loose rubber mounts.....	Tighten mounting hardware for rubber mounts.
Motor drive belts slipping.....	Adjust drive belts (par. 67).

40. Screen Will Not Vibrate

<i>Probable cause</i>	<i>Possible remedy</i>
Drive belts slipping.....	Adjust drive belts (par. 67).
Circuit breaker tripped.....	Correct the cause of overload and reset circuit breaker.

41. Feeder Will Not Operate or Works Slowly

<i>Probable cause</i>	<i>Possible remedy</i>
Drive belts slipping.....	Adjust drive belts (par. 70).
Circuit breaker tripped.....	Correct the cause of overload and reset circuit breaker.

42. Rotary Elevator Will Not Turn or Turns at Low Speed

<i>Probable cause</i>	<i>Possible remedy</i>
Drive belts slipping.....	Adjust drive belts (par. 72).
Circuit breaker tripped.....	Correct the cause of overload and reset circuit breaker.

43. Electric Motors Will Not Run

<i>Probable cause</i>	<i>Possible remedy</i>
Main circuit breaker tripped.....	Correct cause of emergency and reset main circuit breaker.
Voltage source fluctuating.....	Check power source for proper voltage (par. 81).

Upon the decision of the unit commander during emergencies, the following expedient repairs may be used to correct temporary operational troubles in the field where supplies and repair parts for normal corrective maintenance

are not available. Equipment so repaired be removed from operation as soon as possible and properly repaired before being placed in operation again.

46. Engine Gradually Lases Power

Trouble
Fuel filters clogged

Expedient remedy
Discard the fuel filters and operate the engine with new filters until replacements are available.

47. Engine Overheats or Runs Cold

Trouble
Coolant thermostat defective

Expedient remedy
Remove defective thermostat and operate engine until replacement is available.

48. Loss of Lubricating Oil

Trouble
Small hole in crankcase oil pan
Damaged oil line

Expedient remedy
Plug hole with wooden plug or metal screw.
Tape or wrap the oil line with a suitable material until a new oil line can be installed.

49. Loss of Fuel

Trouble
Hole in fuel tank
Fuel line damaged

Expedient remedy
Plug hole with wooden plug or metal screw.
Tape or wrap fuel line with a suitable material until a new fuel line can be installed.

Section VI. FUEL SYSTEM

50. General

The engine fuel system consists of a 100-gallon fuel tank, fuel lines and fittings, primary fuel filter, primer pump, secondary fuel filter, fuel injector pump, and six fuel injectors.

51. Primary and Secondary Fuel Filters Service

Service the primary and secondary fuel filters as instructed on figure 21.
Note. Service the fuel filters weekly.

52. Bleeding the Fuel System

Bleed the fuel system in the sequence as instructed on figure 22.

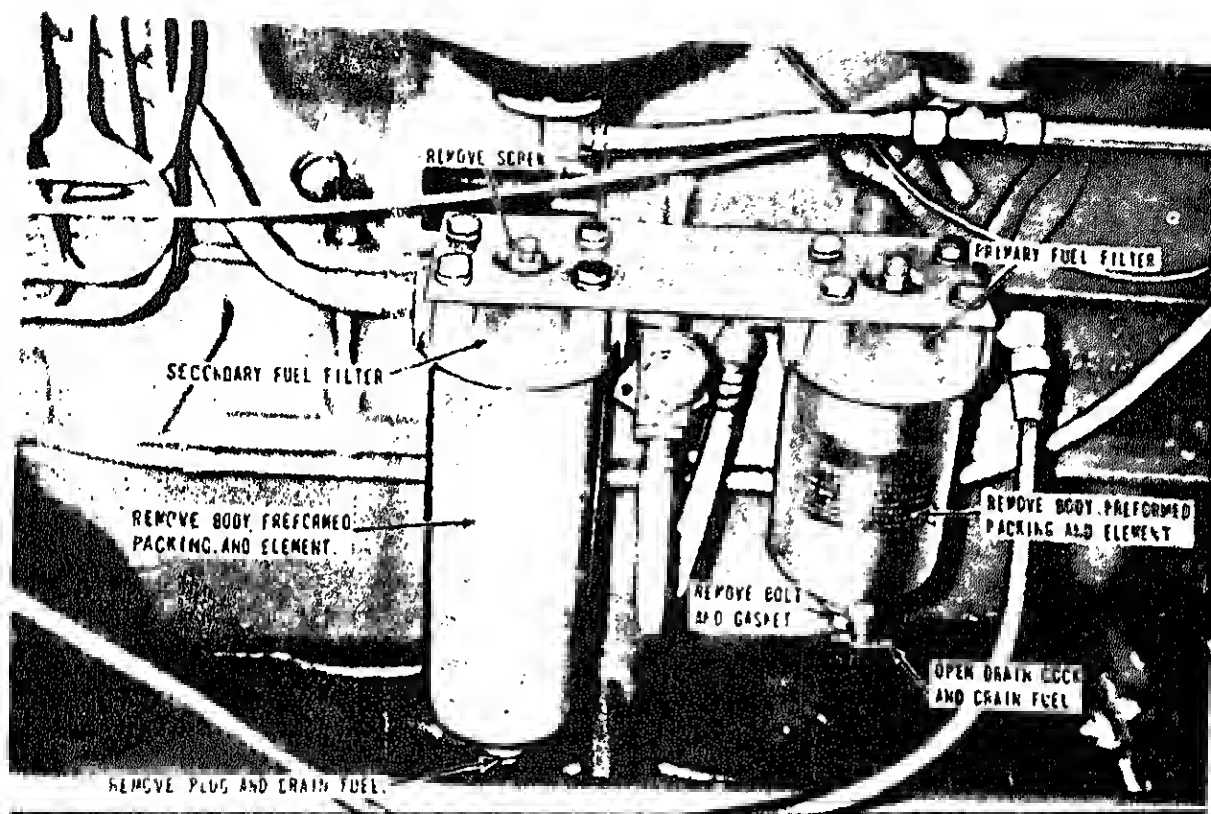
53. Air Cleaner Service

Service the air cleaner as instructed on figure 23.

54. Fuel Tank and Strainer Service

Service the fuel tank and strainer as instructed on figure 24.

Caution: The manual control fording valve located inside the fuel tank cap is closed before shipment is made from contractor's plant. For proper ventilation of fuel tank, valve must be opened when crusher is in operation.



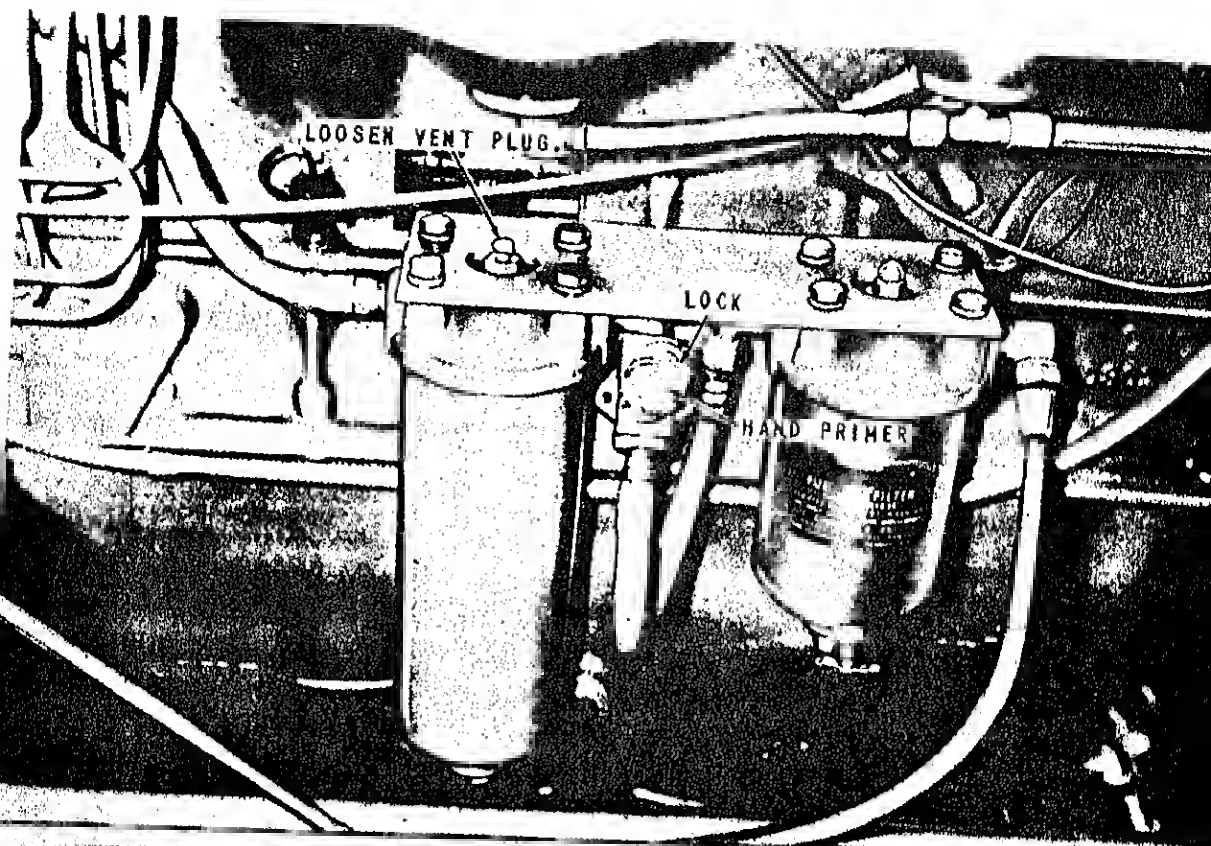
NOTE: CLEAN THE BODY,
REPLACE ELEMENT AND
PREFORMED PACKING.

NOTE: AFTER SERVICING THE
FILTERS, BLEED THE FUEL
SYSTEM, START THE ENGINE,
INSPECT FOR LEAKS.

NOTE: CLEAN THE BODY AND
ELEMENT, REPLACE
PREFORMED PACKING,
REPLACE OBSOLETE
ELEMENT.

EMC 3826-755-10/1/22

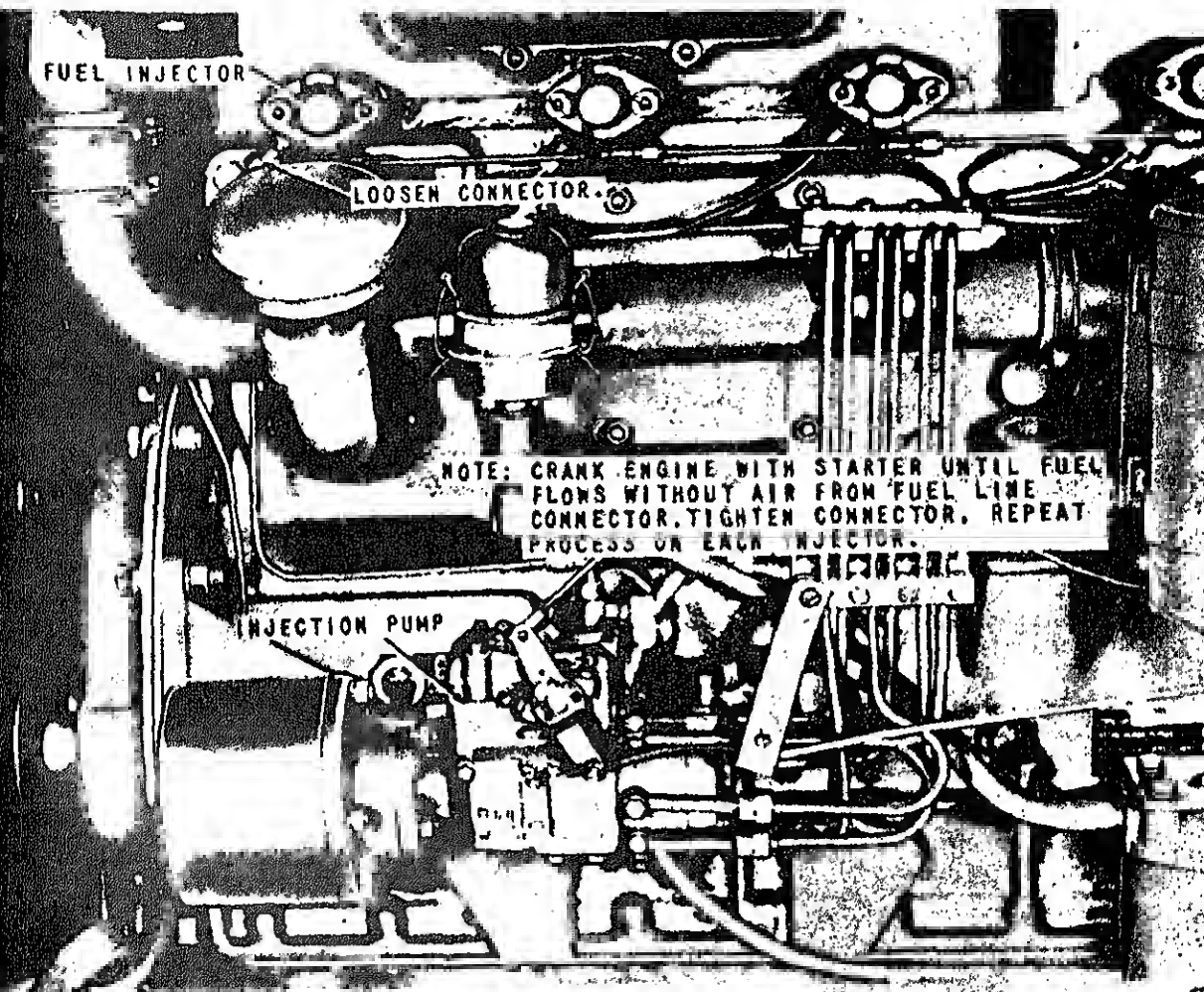
Figure 21. Primary and secondary fuel filters service.



NOTE: RELEASE LOCK AND OPERATE HAND PRIMER
UNTIL FUEL FLOWS WITHOUT AIR FROM
VENT PLUG. TIGHTEN VENT PLUG.

EMC 3820-205-10/1/2 ①

Figure 22. Bleeding the fuel system.



FUEL INJECTOR

LOOSEN CONNECTOR.

NOTE: CRANK ENGINE WITH STARTER UNTIL FUEL
FLOWS WITHOUT AIR FROM FUEL LINE
CONNECTOR. TIGHTEN CONNECTOR. REPEAT
PROCESS ON EACH INJECTOR.

INJECTION PUMP

EMC 3820-205-10/1/23

Figure 22—Continued.

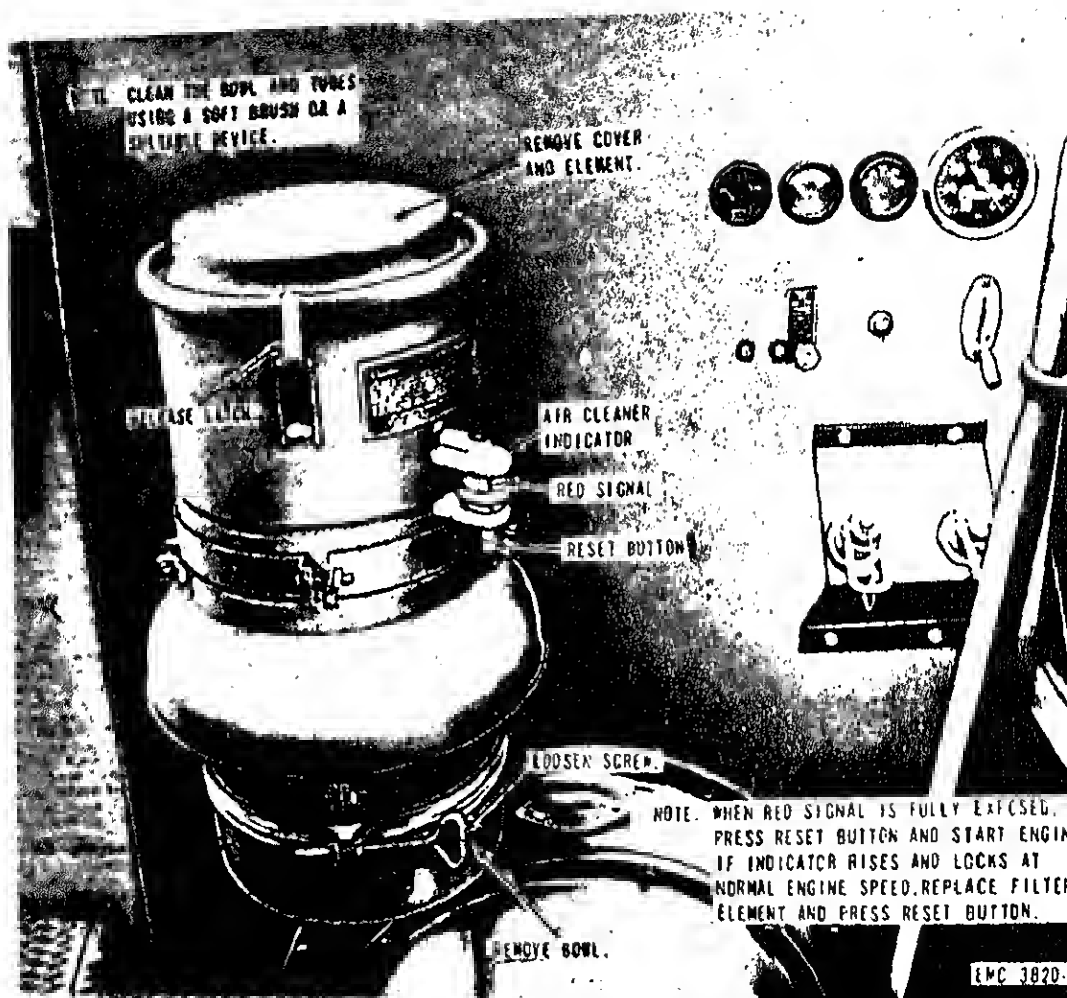
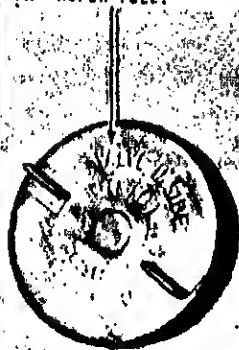


Figure 23. Air cleaner service.



FUEL GAGE

REMOVE CAP AND FILL TANK
WITH PROPER FUEL.



NOTE: CLEAN CAP AND STRAINER, INSPECT
FOR BROKEN OR DEFECTIVE GAGE.

A

DRAIN VALVE

FUEL SHUTOFF VALVE

NOTE: OPEN DRAIN VALVE AND DRAIN FUEL
SEDIMENT AND CONDENSATION INTO A
SUITABLE CONTAINER.

B

The liquid cooling system consists of the radiator, hoses, lines, fittings, water pump, fan, and coolant passages in the engine cylinder heads and block. The coolant temperature is regulated from 165° to 185° F. by two thermostats located inside the thermostat housing.

Service the radiator as instructed
25.

57. Fan Belts Adjustment

Adjust the fan belts as instructed
26.

NOTE: BEFORE SERVICING,
START AND OPERATE
THE ENGINE UNTIL
NORMAL OPERATING
TEMPERATURES ARE
REACHED.



REMOVE CAP AND FILL
WITH PROPER COOLANT.

COVER

NOTE: FILL TO 2 INCHES
BELOW FILLER NECK.

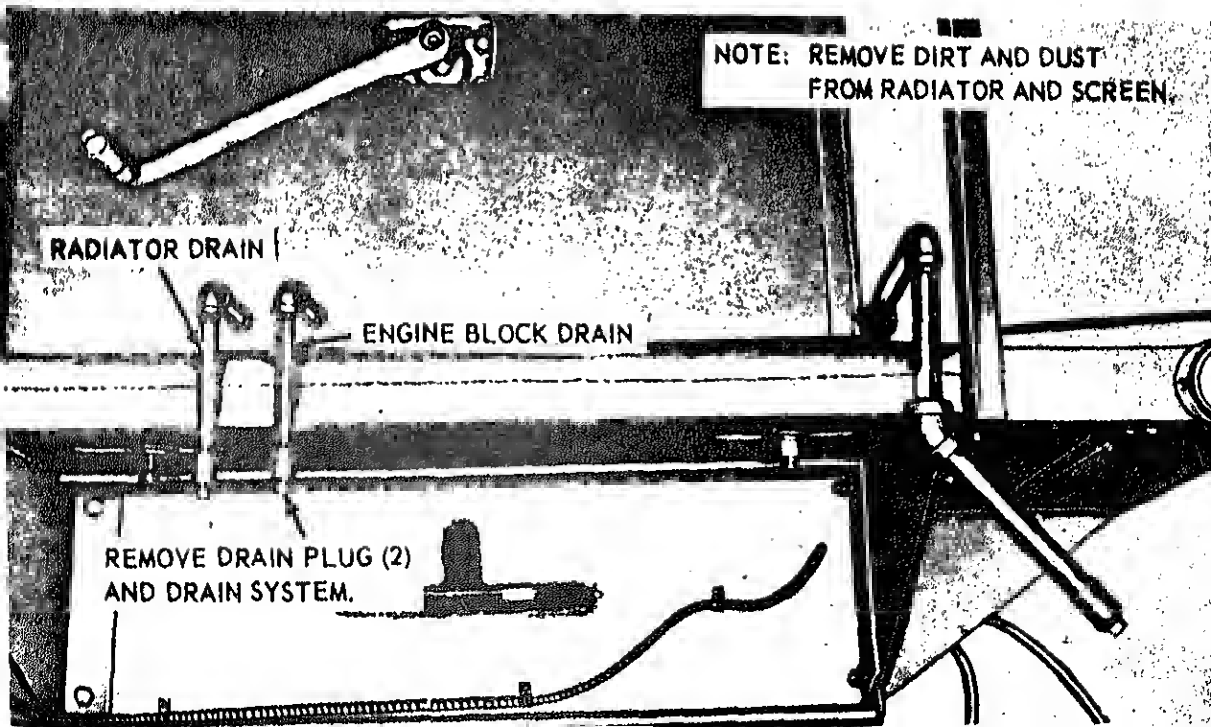
A

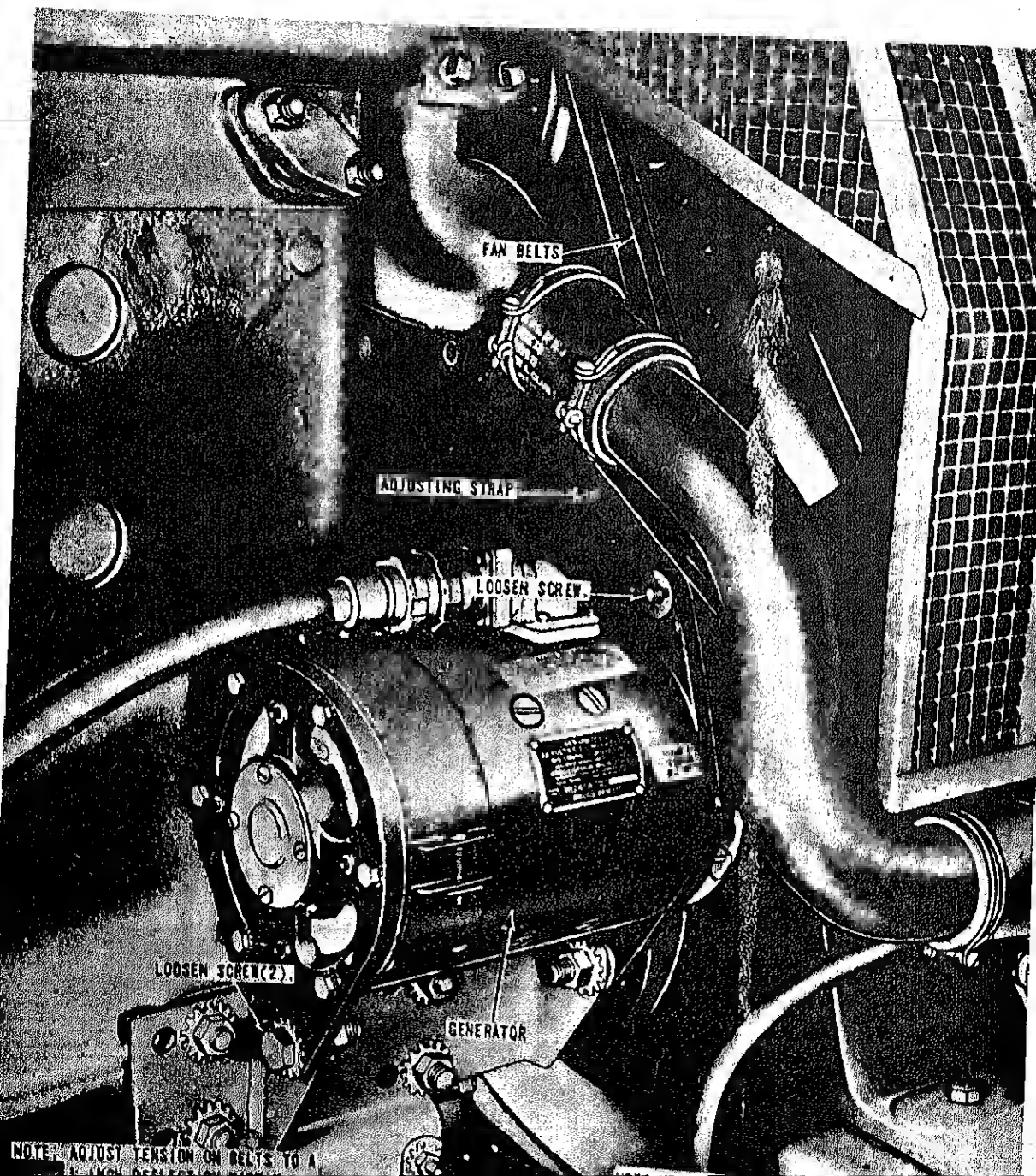
NOTE: REMOVE DIRT AND DUST
FROM RADIATOR AND SCREEN.

RADIATOR DRAIN

ENGINE BLOCK DRAIN

REMOVE DRAIN PLUG (2)
AND DRAIN SYSTEM.





FAN BELTS

ADJUSTING STRAP

LOOSEN SCREW

LOOSEN SCREW(2)

GENERATOR

NOTE: ADJUST TENSION ON BELTS TO A

The engine electrical system consists of the generator, generator regulator, four 12-volt batteries, and the safety cutout control assembly and components. The batteries are connected in series-parallel to provide 24 volts for the engine electrical system. The electrical system has a negative ground.

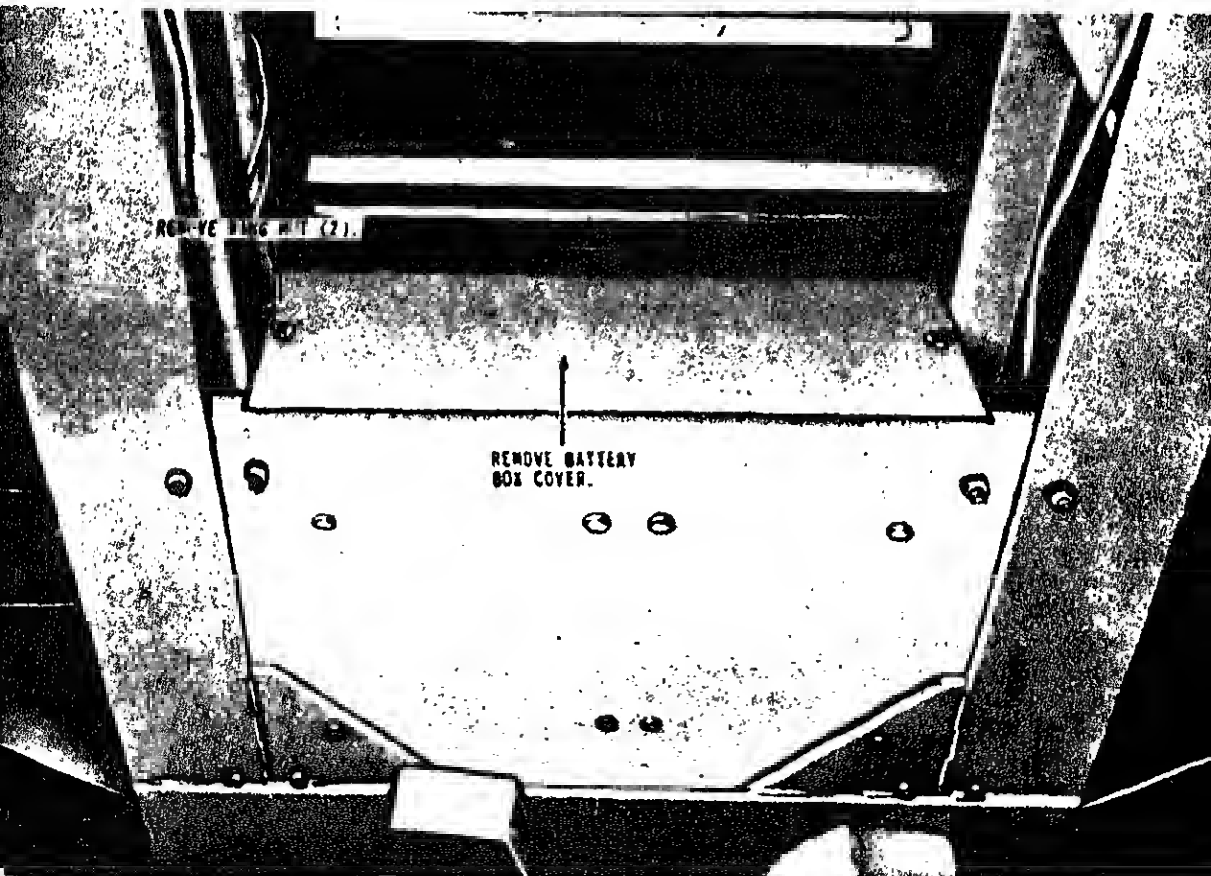
59. Batteries Service

a. Service the batteries as instructed on figure 27.

open flame near storage batteries during soon after charging. Hydrogen gas is generated during charging which can cause explosion if ignited. Do not lay tools across battery terminals which could create a spark. Avoid spilling electrolyte on hands or clothing.

b. To inspect and adjust the battery clamp, proceed as follows:

- (1) Loosen locknut and place clamp handle up or at right angle to battery terminal.



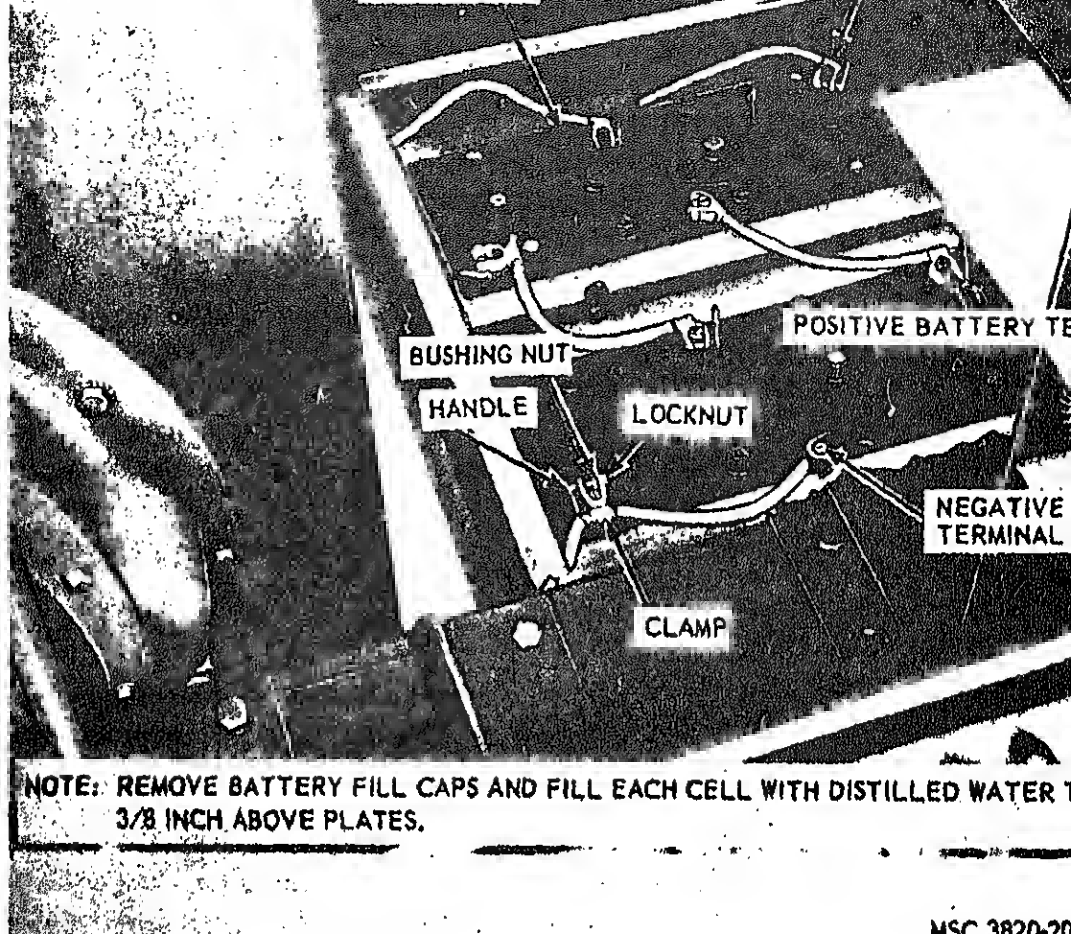


Figure 27—Continued.

- (2) Remove clamps from battery terminals; inspect clamps for loose or corroded condition. Remove corrosion and coat battery terminals and clamps with grease.

- (3) Install clamps on battery terminals. Tighten bushing nut to fit between lug and battery terminal.
- (4) Tighten locknut and push terminal until parallel with clamp.

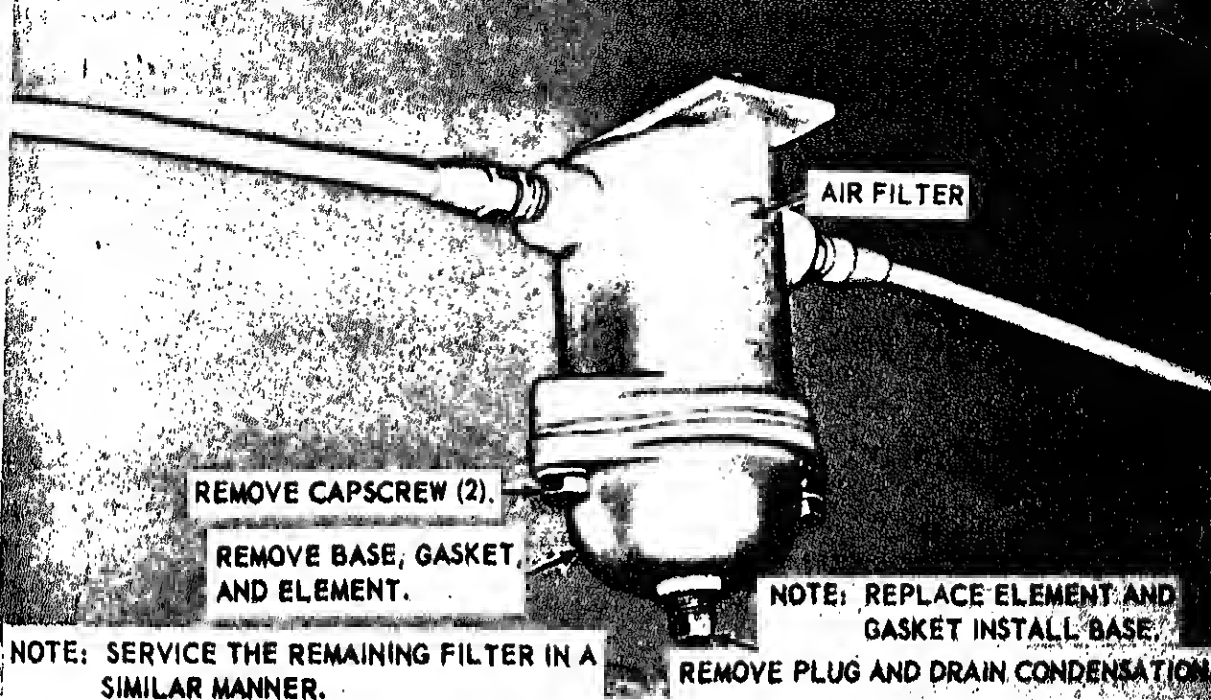
Section IX. AIRBRAKE SYSTEM

60. General

The airbrake system has two filters to re-

61. Air System Service

- a. Service the air filters as instructed.



62. General

The engine clutch assembly engages and disengages the power from the diesel engine to the main drive belts of the crusher.

63. Engine Clutch Assembly

Adjust the engine clutch constructed on figure 29.

REMOVE PLATE

ROCKFORD

POWER TAKE-OFF

REMOVE COVER 2

MODEL

PTA-114130-0



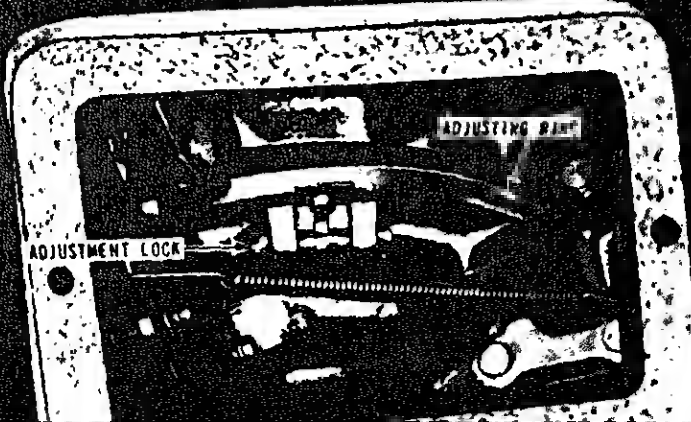
SERIAL NO

CLUTCH ADJUSTMENT: REMOVE COVER AND RELEASE CLUTCH ADJUSTMENT LOCK. TURN ADJUSTING RING COUNTERWISE UNTIL A FIRM FEELING IS OBSERVED TO ENGAGE CLUTCH RE-ENGAGE LOCK.

LUBRICATION: CLUTCH THROWOUT BEARING DAILY. SHAFT BEARINGS EVERY 30 HOURS OF OPERATION.

FOR GEAR REDUCTION TYPE USE S.A.E. 30 OIL IN GEAR BOX. KEEP OILS TO OIL LEVEL.

NOTE: ROTATE CLUTCH ASSEMBLY UNTIL THE ADJUSTMENT LOCK IS IN AN ACCESSIBLE POSITION



REMOVE CASSET

sists of a smooth roll and a grooved roll for crushing stone. It has a spring on each side to allow the smooth roll to move beyond its adjusted clearance to allow tramp iron and other items to pass through the rolls that would otherwise damage the crusher rolls. An adjusting screw, located on each side to adjust the clearance between the crusher rolls, aids in obtaining the desired grade of aggregate.

for the O-rings will be changed. In some cases it may require several hours of operation before the O-rings seat properly against the seal plate and the oil stops leaking. A leak of 2 to 3 quarts of oil in 8 hours is not considered excessive (gearcase capacity is 50 qt) compared to the cost of replacing the O-rings. Furthermore, the O-rings are not designed as a positive-type seal but are designed to allow seepage which will lubricate the O-rings and prevent dust from entering the gearcase. The oil level of the gearcase should be checked each day. Refer to LO 5-3820-205-20/1-1.

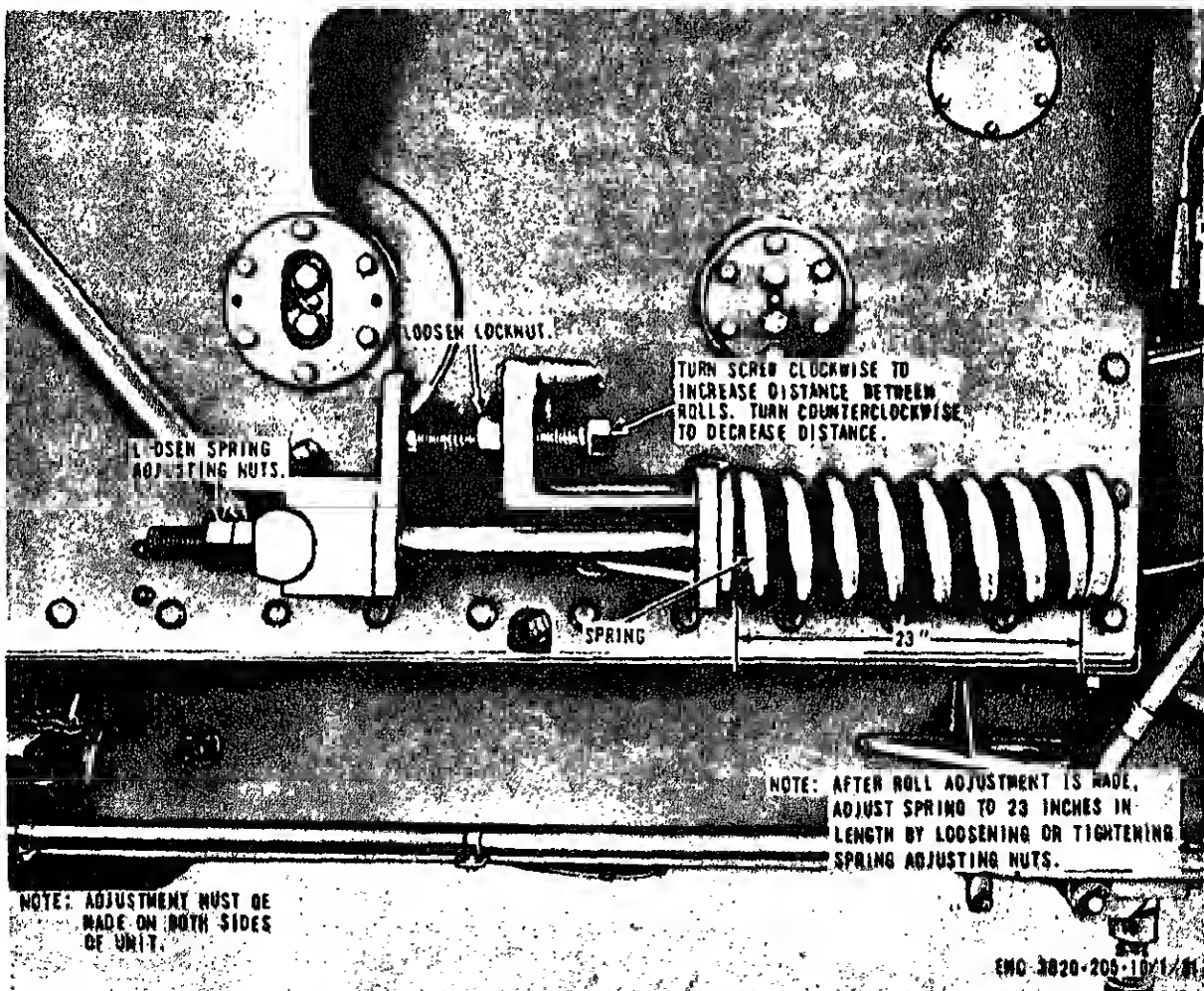


Figure 30. Crusher rolls, adjustment.

General

The vibrating screen is driven by an electric motor. Power is transmitted to the vibrating screen, from the electric motor, by two V-belts. The vibrator screens determine the grades of aggregate desired. When the vibrator screens are changed, the crusher roll clearance must be adjusted (par. 67) to the size of the largest screen opening used.

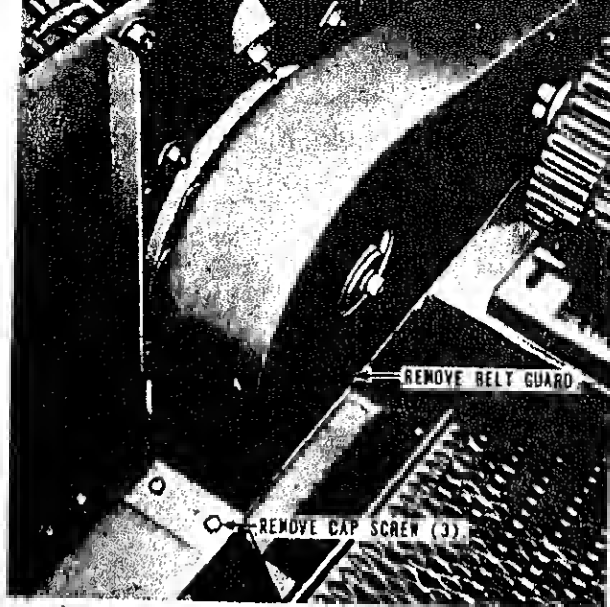
67. Vibrating Screen Drive Belts Adjustment

Adjust the vibrating screen drive belts as instructed on figure 31.

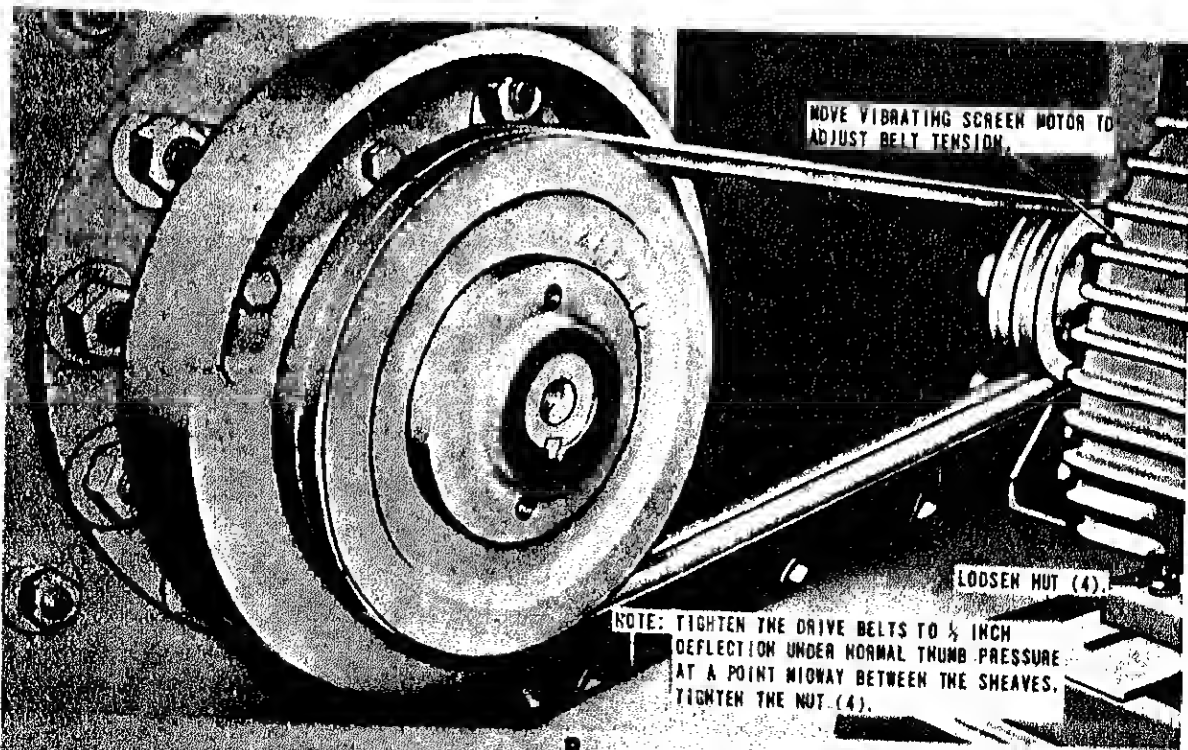
68. Vibrating Screens Replacement

Replace the vibrating screens with the proper sized screens to obtain the desired grades of aggregate in the numerical sequence as instructed on figure 32.

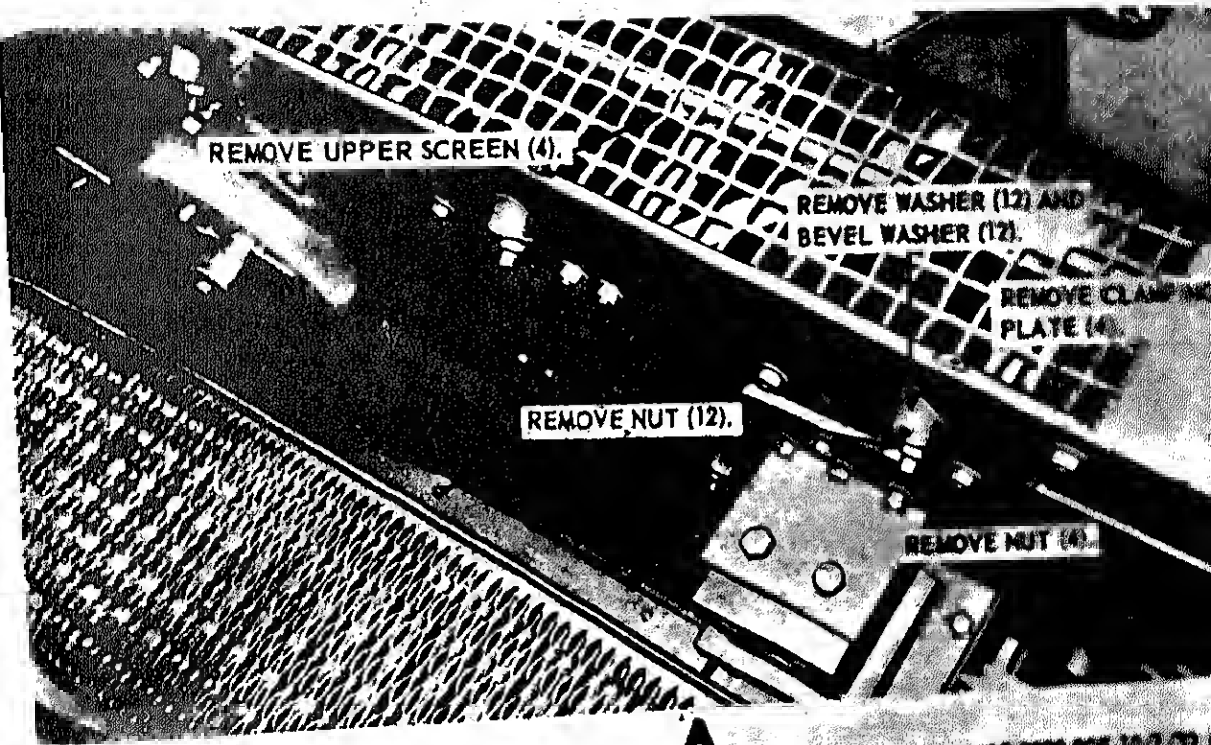
Note. Muffler and plate removal is only necessary when lower screen is to be removed.



A



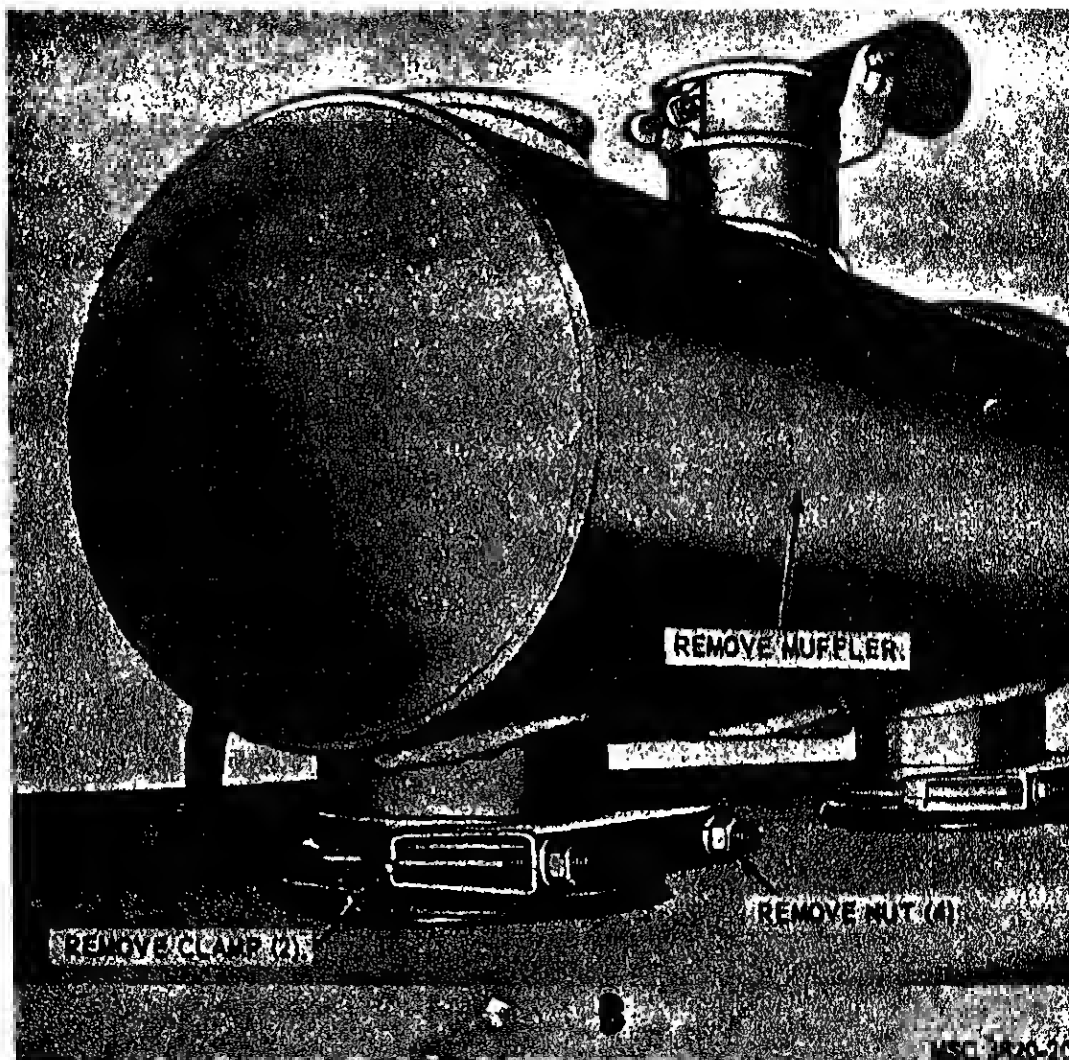
B



NSC 3020-203-10/1/53

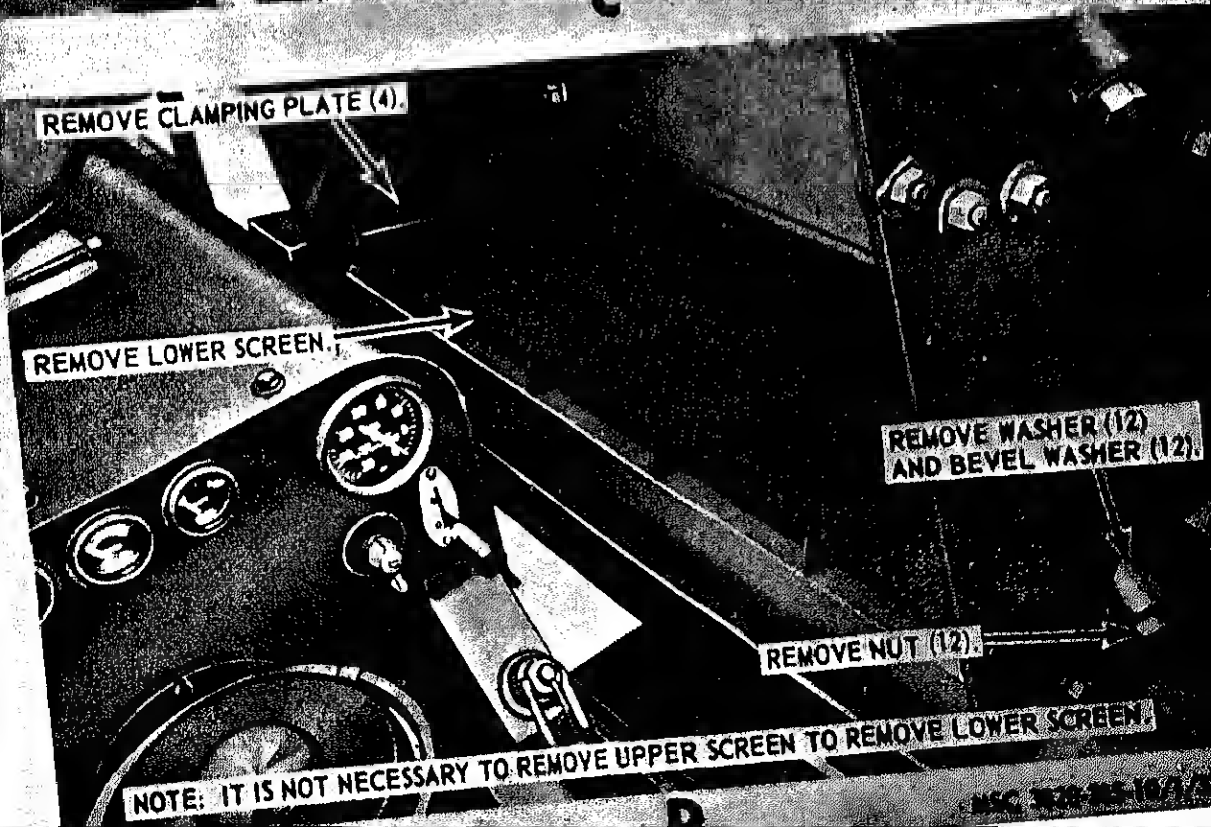
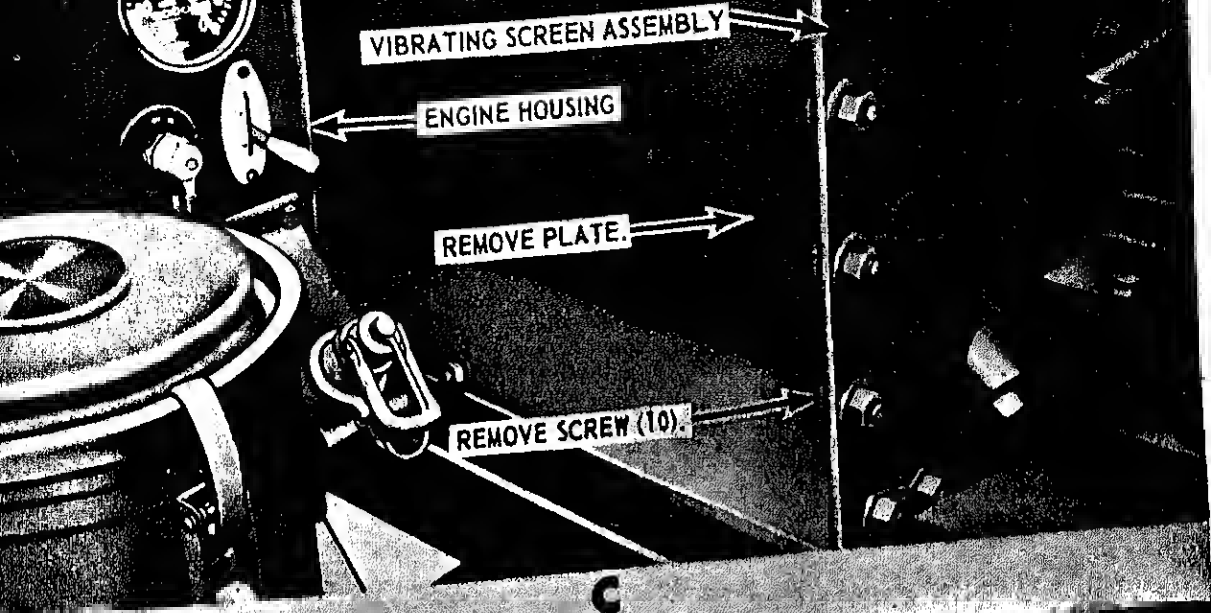
A—Upper screen removal

Figure 32. Vibrating screens, replacement.



B—Muffler removal

Figure 32—Continued.



an electric motor. Power is transmitted from the electric motor to the feeder by two V-belts. on figure 33.



REMOVE NUT (4).

REMOVE BELT GUARD.



NOTE: ADJUST MAIN (FEED) CONVEYOR
DRIVE BELTS IN A SIMILAR MANNER.

LOOSEN NUT (2).

MOVE TURNBUCKLE
CLOCKWISE TO LOOSEN;
COUNTERCLOCKWISE TO
TIGHTEN BELTS.

NOTE: TIGHTEN THE DRIVE BELTS TO $\frac{3}{8}$
INCH DEFLECTION UNDER NORMAL
THUMB PRESSURE AT A POINT MIDWAY
BETWEEN THE SHEAVES. TIGHTEN THE
NUT (2).

regate being discharged by the return conveyor onto the main conveyor. It is driven by an electric motor. Power is transmitted from the electric motor to the rotary elevator by two V-belts.

72. Rotary Elevator Drive Belts Adjustment

a. Remove the belt guard on the rotary eleva-

tor. Adjust the rotary elevator drive belts as instructed on figure 34.

c. Install the rotary elevator drive belt guard in the same manner as the feeder drive belt guard (par. 71).

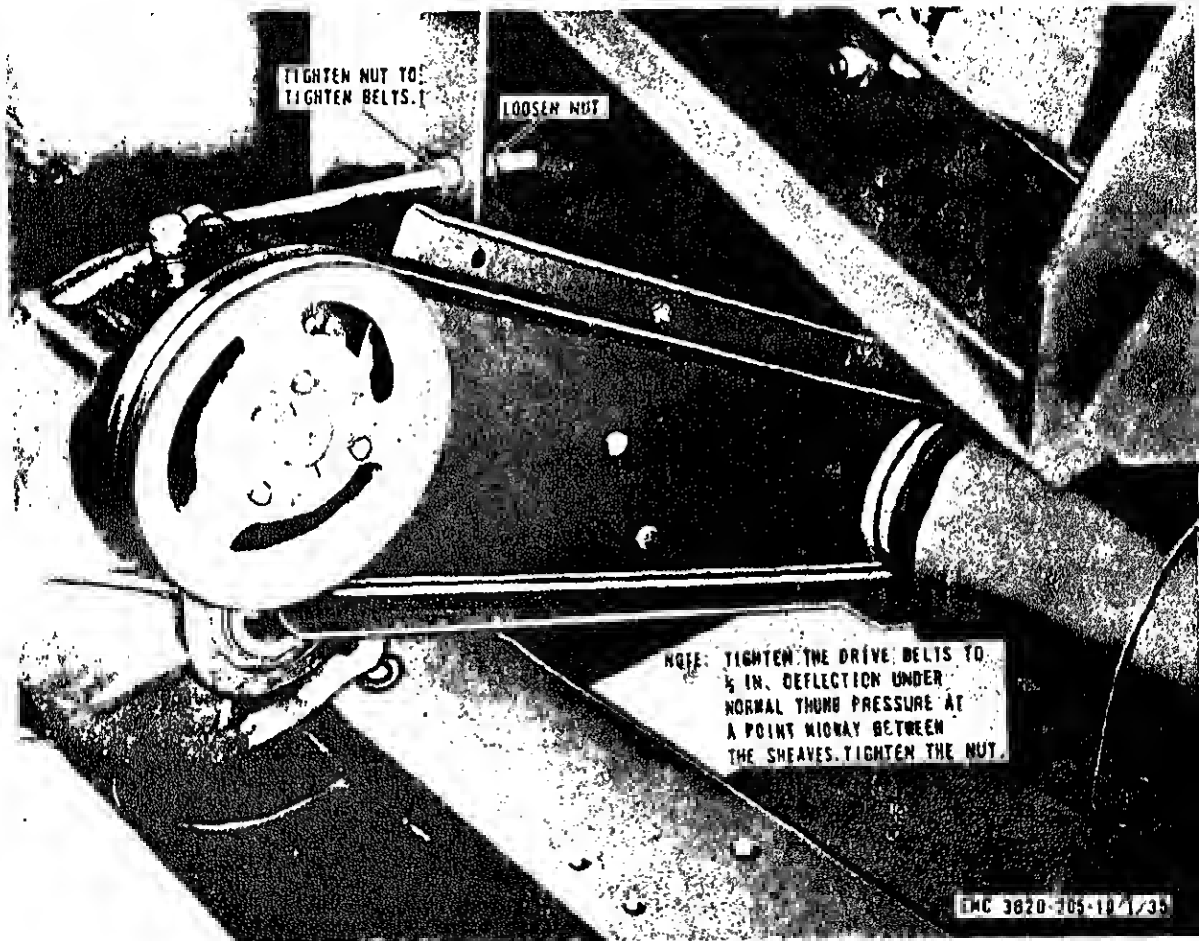


Figure 34. Rotary elevator drive belts, adjustment.

crusher aggregate being discharged by the crusher rolls into the roll elevator. It is driven by an electric motor. Power is transmitted from the electric motor to the return (under) conveyor by two V-belts.

a. Remove the return (under) conveyor belt guard from the unit as instructed on figure 36.

b. Adjust the return (under) conveyor drive belts in the same manner as the feeder drive belts (par. 71).

c. Install the return (under) conveyor drive belt guard on the unit in reverse of the instructions on figure 36.

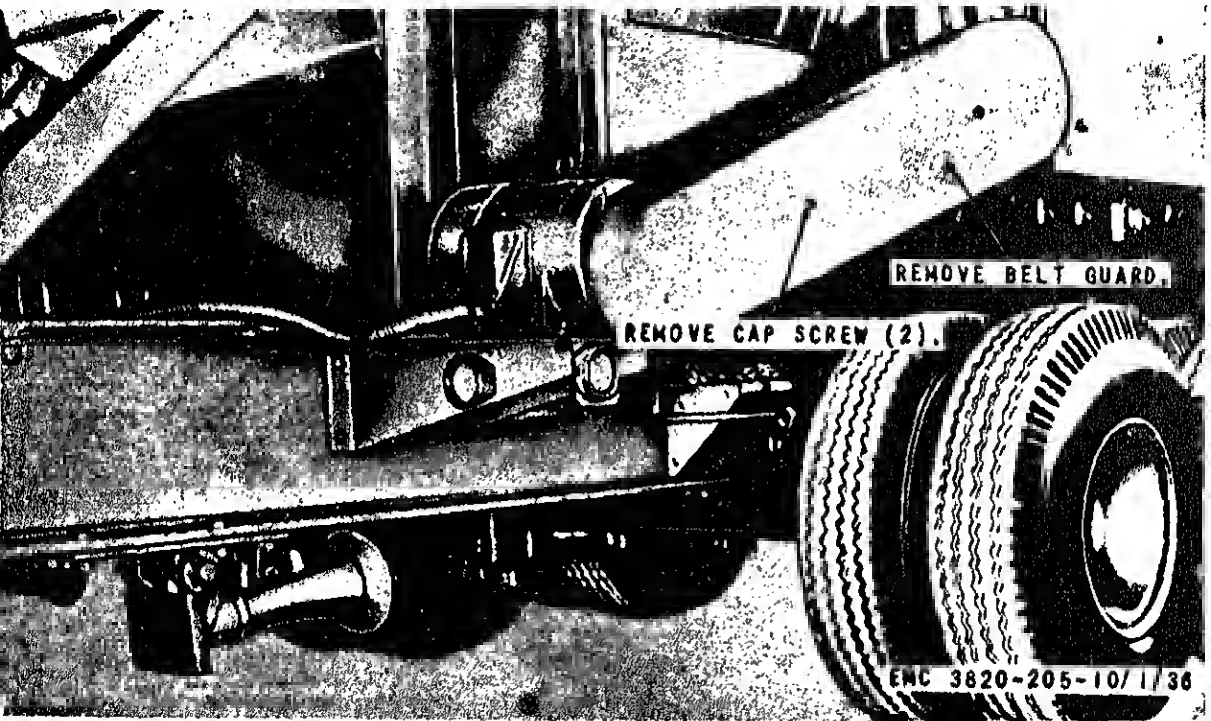


Figure 35. Return (under) conveyor drive belt guard, removal and installation.

5. General

The main (feed) conveyor assembly conveys aggregate from the feeder hopper and roll elevator to the vibrator screen assembly. The main (feed) conveyor is driven by an electric motor. Power is transmitted from the electric motor to the main (feed) conveyor by two V-belts.

76. Main (Feed) Conveyor Drive Belt Adjustment

- Remove the main (feed) conveyor drive belt guard from the unit as instructed on figure 36.
- Adjust the main (feed) conveyor drive belts in the same manner as the feeder drive belts (par. 71).
- Install the main (feed) conveyor drive belt guard on the unit in reverse of the instructions on figure 36.

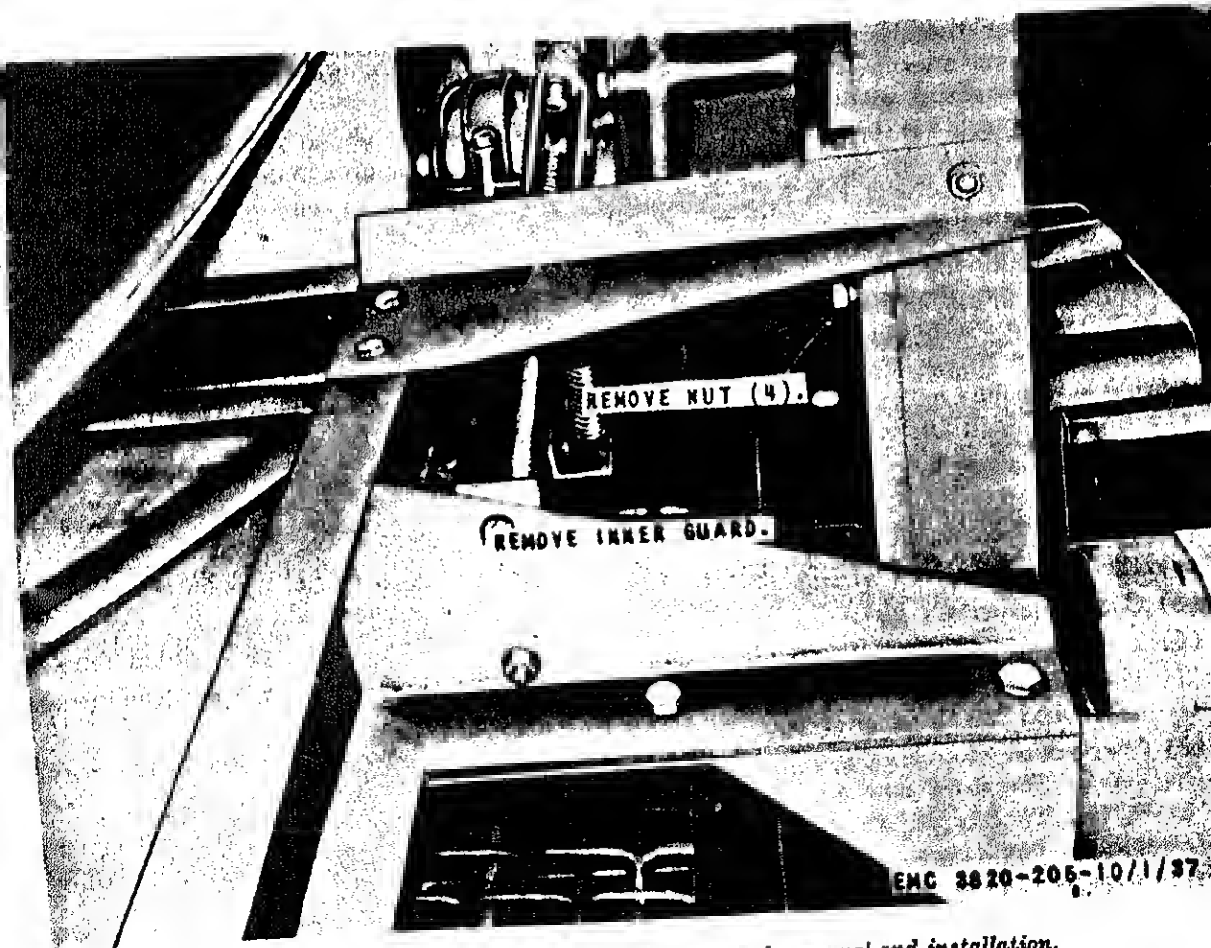


Figure 36. Main (feed) conveyor drive belt guard, removal and installation.

CHAPTER 4

DEMOLITION OF THE ROLL CRUSHER TO PREVENT ENEMY USE IN CONJUNCTION WITH THE ROLL CRUSHER

77. General

When capture or abandonment of the roll crusher to an enemy is imminent, the responsible unit commander must make the decision either to destroy the equipment or to render it inoperative. Based on this decision, orders are issued which cover the desired extent of destruction. Whatever method of demolition is employed, it is essential to destroy the same vital parts of all roll crushers and all corresponding repair parts.

78. Demolition To Render the Roll Crusher Inoperative

a. *Demolition by Mechanical Means.* Use sledge hammers, crowbars, picks, axes, or any other heavy tools which may be available to destroy the following:

- (1) Engine block and manifolds.
- (2) Engine governor, fuel pump, and water pump.
- (3) Electric motors.
- (4) Electric cables and wiring.
- (5) Conveyor belts.
- (6) The radiator and clutch housing.
- (7) The electrical control boxes (open doors and smash inner components).
- (8) Gearboxes.

Note. The above steps are the minimum requirements for this method.

b. *Demolition by Misuse.* Perform the following steps to render the roll crusher inoperative.

- (1) Drain the radiator and engine crankcase. Pour sand in the engine crank-

79. Demolition by Explosives or Weapons Fire

a. *Explosives.* Place as many of the following charges shown in figure 37 as the situation permits and detonate them simultaneously with detonating cord and suitable detonator.

- (1) One ½-pound charge on each cylinder head.
- (2) One ½-pound charge between injection pump and engine block.
Note. The above charges are the minimum requirements for this method.
- (3) One ½-pound charge on main (feed) conveyor motor.
- (4) One ½-pound charge on vibration screen vibrator.
- (5) One ½-pound charge on rotary elevator motor.
- (6) One ½-pound charge on feeder motor.
- (7) One ½-pound charge on return (under) conveyor motor.
- (8) One ½-pound charge on the vibration screen motor.
- (9) One 1-pound charge on clutch housing.
- (10) Six ½-pound charges between crusher rolls.
- (11) Two ½-pound charges inside rotary elevator wheel.

b. *Weapons Fire.* Fire on the roll crusher with the heaviest practical weapons available.

80. Other Demolition Methods

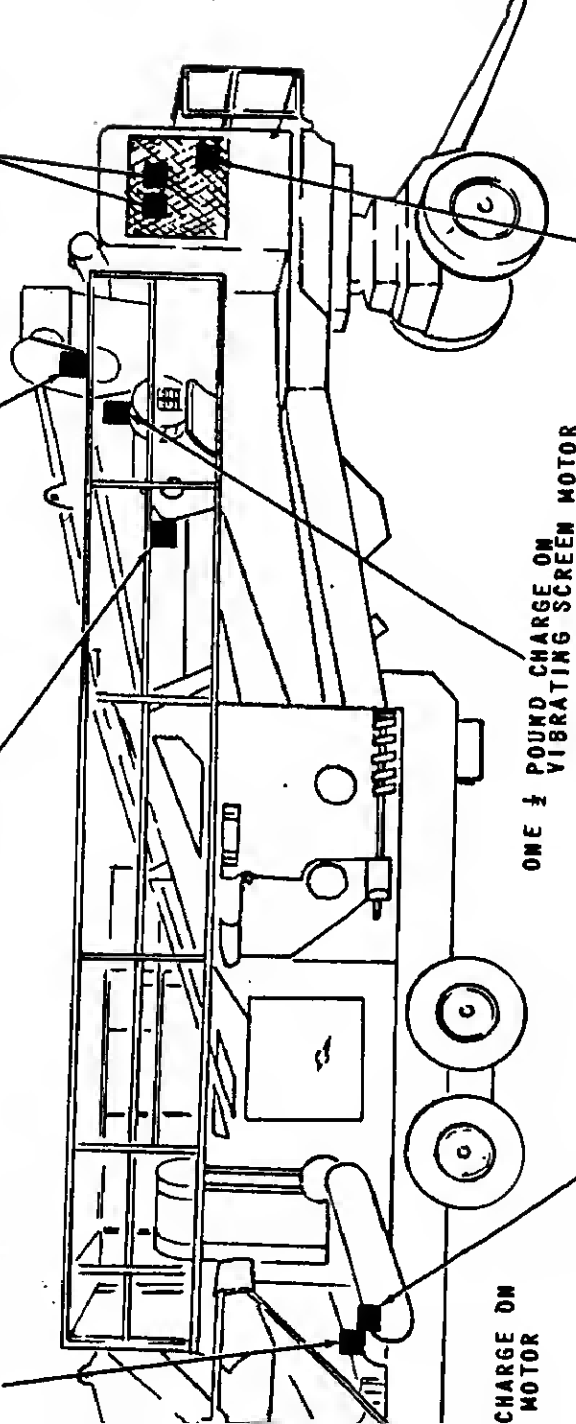
a. *Scattering and Concealment.* Remove as easily accessible parts such as injection pump,

ONE ½ POUND CHARGE ON
MAIN (FEED) CONVEYOR MOTOR

ONE ½ POUND CHARGE ON
VIBRATING SCREEN VIBRATOR

ONE ½ POUND CHARGE ON
EACH CYLINDER HEAD (

10 CHARGE ON
DRY ELEVATOR MOTOR



CHARGE ON
MOTOR

ONE ½ POUND CHARGE ON
VIBRATING SCREEN MOTOR

ONE ½ POUND CHARGE ON
RETURN (UNDER)
CONVEYOR MOTOR

ONE ½ POUND CHARGE BETWEEN
FUEL INJECTION PUMP
AND ENGINE BLOCK

POUND CHARGE

EMC 2000 205 10/1/10

and around, the conveyor belts, tires, electric motors, fuel tank, and engine. Saturate packing with gasoline, oil, or diesel fuel ignite.

Submersion. Totally submerge the roll over, if possible, in a body of water to produce water damage and concealment. Salt water damage metal parts more than fresh water.

Training

All operators should receive thorough train-

ing to FM 5-28. Simulated destruction, using all of the methods listed above, should be included in the operator training program. It must be emphasized in training, that demolition operations are usually necessitated by critical situations when time available for carrying out destruction is limited. For this reason, it is necessary that operators be thoroughly familiar with all methods of destruction of equipment and be able to carry out demolition instructions without reference to this or any other manual.

1. Dictionaries of Terms and Abbreviations

AR 320-5 Dictionary of United States Army Terms.
AR 320-50 Authorized Abbreviations and Brevity Codes.

2. Fire Protection

TM 5-687 Repairs and Utilities: Fire Protection Equipment and Appliances; Inspections, Operations, and Preventive Maintenance.
TM 9-1799 Ordnance Maintenance: Fire Extinguishers.

3. Lubrication

LO 5-3820-205-20/1-1 Lubrication Order.

4. Painting

TM 9-1213 Painting Instructions for Field Use.

5. Preventive Maintenance

AR 750-5 Maintenance Responsibilities and Shop Operation.
TM 9-1870-1 Care and Maintenance of Pneumatic Tires,
TM 9-6140-200-15 Storage Batteries, Lead-Acid Type.
TM 38-750 The Army Equipment Records System and Procedures.

6. Publication Indexes

DA Pam 310-4 Index of Technical Manuals, Technical Bulletins, Supply Manuals (types 4, 6, 7, 8, and 9), Supply Bulletins, Lubrication Orders, and Modification Orders.

7. Training Aids

FM 5-25 Explosives and Demolitions.
FM 21-5 Military Training.
FM 21-6 Techniques of Military Instruction.
FM 21-30 Military Symbols.

8. Supply Publications

SM 10 C9100-SL Petroleum, Petroleum-Base Products, and Related Material.
SM 3-C6800-ML List of Standard Lubricants, Hydraulic Fluids, Liquid Fuels, and Preservative Material Used by the Army.

APPENDIX II

BASIC ISSUE ITEMS LIST AND MAINTENANCE AND OPERATING SUPPLIES

Section I. INTRODUCTION

I. General

Section II lists the accessories, tools, and publications required in 1st echelon maintenance and operation, initially issued with, or authorized for the roll crusher. Section III lists the maintenance and operating supplies required for initial operation.

2. Explanation of Columns Contained in Section II

a. *Source Codes.* The information provided each column is as follows:

- (1) *Materiel.* This column lists the basic materiel code number of the supply service assigned responsibility for the part. Blank spaces denote supply responsibility of the preparing agency. Other basic materiel code numbers are—

- 3—Chemical Materiel
- 9—Ordnance Materiel
- 10—Quartermaster Materiel
- 12—Adjutant General

- (2) *Source.* The selection status and source of supply for each part are indicated by one of the following code symbols:

- (a) P—applied to high-mortality repair parts which are stocked in or supplied from the supply service depot system, and authorized for use at indicated maintenance echelons.

- (b) Pi—applied to repair parts which

stall, or manufacture the part is indicated by the following code symbol

O—Organizational Maintenance
(1st and 2d Echelon)

b. *Federal Stock Numbers.* The Federal stock number will be shown in this column, and will be used for requisitioning purposes.

c. *Description.*

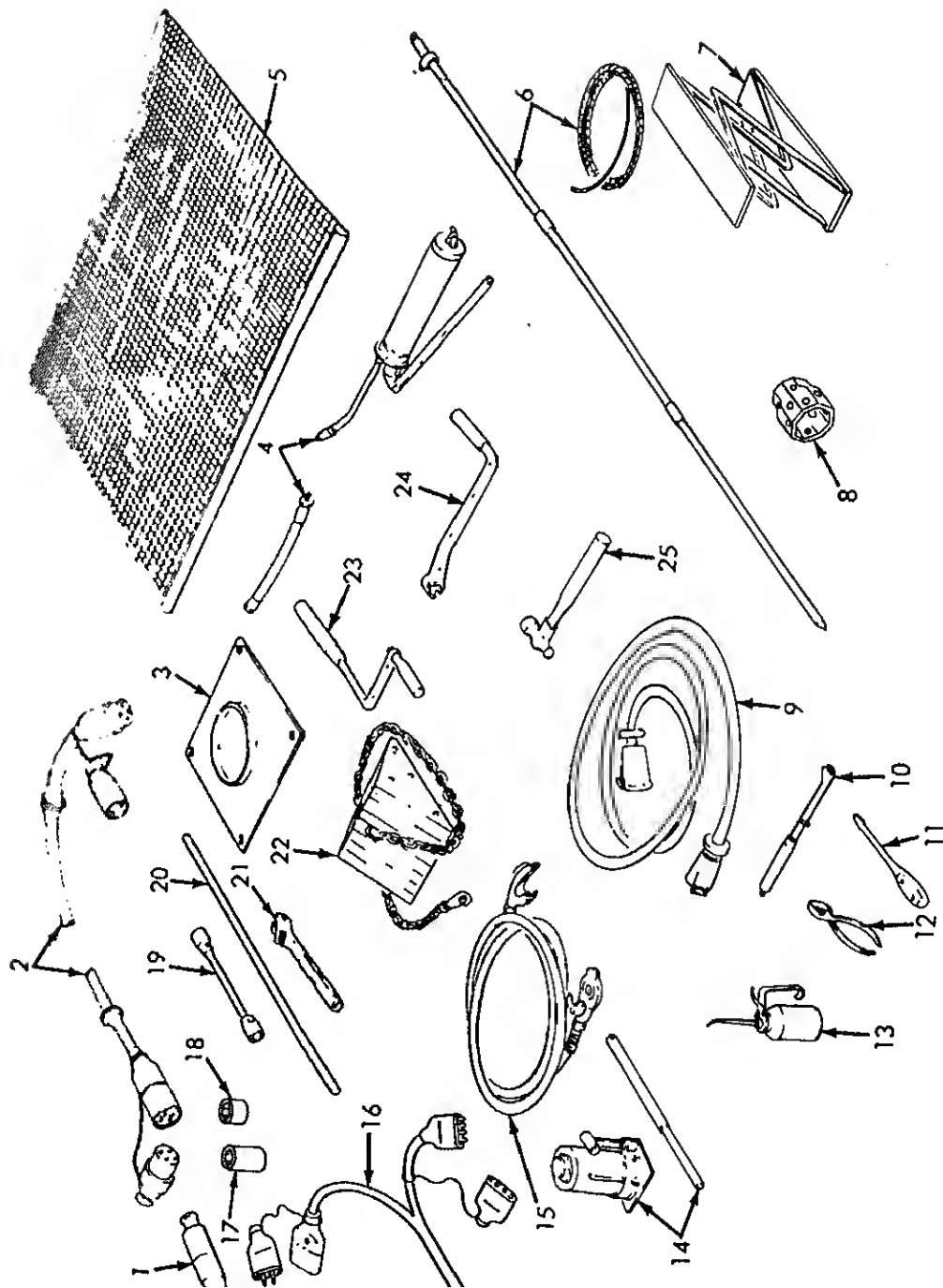
- (1) The item name and a brief description of the part are shown.
- (2) A five-digit Federal supply code for manufacturers and/or other supply services is shown in parentheses followed by the manufacturer's part number. This number shall be used for requisitioning purposes when no Federal stock number is indicated in the Federal stock number column.
Example: (90129) X861724.

d. *Unit of Issue.* If no abbreviation is shown in this column, the unit of issue is "each".

e. *Quantity Authorized.* This column lists the quantities of repair parts, accessories, tools, or publications authorized for issue to the equipment operator or crew as required.

f. *Quantity Issued with Equipment.* This column lists the quantities of repair parts, accessories, tools, or publications that are initially issued with each item of equipment. Those indicated by an asterisk are to be requisitioned through normal supply channels as required.

g. *Illustrations.* This column is subdivided into two columns which provide the following information.



4	Hand grease gun	13	Hand oiler	21	Adjustable wrench
5	Wire screen	14	Hand hydraulic jack	22	Block chock assembly
6	Ground rod assembly	15	Service hose	23	Handcrank, cable reel
7	Trestle	16	Feeder power cable	24	Handcrank, starting
8	Wheel bearing wrench	17	Deep style socket	25	Hand hammer
9	Wiring harness				

Figure 33.—Continued

3. Federal Supply Code for Manufacturers

14351	Continental Motors Corp.
92858	Hannay, Clifford B. & Son, Inc.
00000	Ordnance Corps
18990	Eagle Crusher Co.
63477	Wagner Electric Corp.
90129	Joy Manufacturer Co. Electric Products
55719	Snap-on Tool Corp. Div.

4. Explanation of Columns Contained in Section III

a. Item. This column contains numerical sequenced item numbers, assigned to each component application, to facilitate reference.

b. Component Application. This column identifies the component application of each maintenance or operating supply item.

c. Source of Supply. This column lists the basic materiel code number of the supply service assigned responsibility for the item. Blank spaces denote supply responsibility of the preparing agency. Other basic materiel code numbers are—

9—Ordnance Materiel

10—Quartermaster Materiel

11—Signal Materiel

12—Adjutant General

55—Transportation Materiel

d. Federal Stock Number. The Federal stock number will be shown in this column and will be used for requisitioning purposes.

e. Description. The item and a brief description are shown.

f. Quantity Required for Initial Operation. This column lists the quantity of each maintenance or operation supply item required for initial operation of the equipment.

g. Quantity Required for 8 Hours Operation. Quantities listed represent the estimated requirements for an average 8 hours of operation.

h. Notes. This column contains informative notes keyed to data appearing in the preceding column.

GROUP 31--BASIC ISSUE ITEMS
MANUFACTURER INSTALLED

3100--BASIC ISSUE ITEMS, MANU-
FACTURER OR DEPOT INSTALLED

			5140-057-2554	BATTERY, STORAGE: 12 v, 6 cell (Repair Parts Manual Group 0612).	4	4	
				BLOCK, CHOCK ASSEMBLY: w/ chain (00000) 8343584 (Repair Parts Manual Group 3100).	4	4	38
				CABLE, POWER: pigtail (90129) X861724 (Repair Parts Manual Group 2202).	1	1	38
				CABLE, POWER: 100 feet long (90129) X8617-25 (Repair Parts Manual Group 2202).	1	1	38
				CABLE, FEEDER POWER: 75 feet long (18990) 20610.	1	1	38
			7520-559-9618	CASE: operation and maintenance pub- lications, cotton duck, water repellent and mildew resistant.	1	1	
				CRANK, HAND: cable reel (20858) H- 10616 A-32 (Repair Parts Manual Group 1808).	1	1	38
				CRANK, HAND: starting (14351) 31- R02020 (Repair Parts Manual Group 0107).	1	1	38
				DEPARTMENT OF THE ARMY LUBRICATION ORDER LO 5- 3820-205-20/1-1.	1	1	
				DEPARTMENT OF THE ARMY OPERATOR'S MANUAL TM 5- 3820-205-10/1.	2	2	
				DEPARTMENT OF THE ARMY ORGANIZATIONAL MAINTENANCE MANUAL TM 5-3820- 205-20/1.	2	2	
				DEPARTMENT OF THE ARMY ORGANIZATIONAL MAINTENANCE REPAIR PARTS AND SPECIAL TOOL LIST TM 5-3820- 205-20P/1.	2	2	
			6810-240-9354	ELECTROLYTE, SULPHURIC ACID (Repair Parts Manual Group 0612).	Gal	8	8
			4210-383-7129	EXTINGUISHER, FIRE, CARBON DIOXIDE: charged, hand; nonshat- terable cylinder; permanent shutoff valve; squeeze-grip or trigger control; 5-lb MIL Spec E-468, type I, class I (Repair Parts Manual Group 7603).	1	1	
				HARNESS, WIRING: trailer coupling (00000) 7728815 (Repair Parts Man- ual Group 2202).	1	1	38

Source codes				Federal stock No.	Description	Unit of issue	Expendability	Quantity authorized	Quantity issued with equipment	F u
Material	Source	Maintenance	Recoverability							
	P	O	-----		HOSE, SERVICE: (63477) AD2611 (Repair Parts Manual Group 2202).			1	1	
	P	O	-----		PAD, JACK (18990) 20310 (Repair Parts Manual Group 3100).			4	4	
	P	O	-----		ROD ASSEMBLY, GROUND: (18990) 30162 (Repair Parts Manual Group 3100).			3	3	
	P	O	-----	3820-730-5039	SCREEN, ROLLER: ¼ in. mesh (Repair Parts Manual Group 7528).			2	2	
	P	O	-----	3820-730-5938	SCREEN, ROLLER: ½ in. mesh (Repair Parts Manual Group 7528).			2	2	
	P	O	-----	3820-730-5937	SCREEN, ROLLER: ½ in. mesh (Repair Parts Manual Group 7528).			2	2	
	P	O	-----	3820-730-5930	SCREEN, ROLLER: ¾ in. mesh (Repair Parts Manual Group 7528).			2	2	
	P	O	-----	3820-730-5935	SCREEN, ROLLER: 1 in. mesh (Repair Parts Manual Group 7528).			2	2	
	P	O	-----	3820-730-5934	SCREEN, ROLLER: 1½ in. mesh (Repair Parts Manual Group 7528).			2	2	
	P	O	-----	3820-730-5933	SCREEN, ROLLER: 2 in. mesh (Repair Parts Manual Group 7528).			2	2	
	P	O	-----	3820-730-5932	SCREEN, ROLLER: 2½ in. mesh (Repair Parts Manual Group 7528).			2	2	
					GROUP 32—BASIC ISSUE ITEMS TROOP INSTALLED					
					3200—BASIC ISSUE ITEMS TROOP INSTALLED OR AUTHORIZED					
10	P	O	-----	5120-277-8079	EXTENSION, SOCKET WRENCH: 16 in., ¾ in. square drive.			1	*	
9	P	O	-----	4910-273-3662	GAGE, TIRE PRESSURE: calibrations 10- to 160-lb range.			1	*	
10	P	O	-----	4930-360-2801	GREASE GUN, HAND: lever operated, 16-oz capacity.			1	*	
10	P	O	-----	5120-243-2063	HAMMER, HAND: machinist, ball-peen, ½-lb head.			1	*	
10	P	O	-----	5120-240-5368	HANDLE, SOCKET WRENCH: 18½ in., ¾ in. sq drive.			1	*	
10	P	O	-----	5120-244-7329	JACK, HYDRAULIC, HAND: self contained, single pump, w/screw extension FED GGG-J-51, type VII, class 2, style B, 5-ton capacity.			1	*	
10	P	O	-----	4930-260-9166	OILER, HAND: 16-oz capacity			1	*	
10	P	O	-----	5120-223-7396	PLIERS, SLIP JOINT: straight nose,			1	*	

SP of the	Item #	Ma- te- rials	Re- cover- able	Federal stock No.	Description	Unit of issue	Ex- pend- ability	Qty au- thor- ized	Qty issued with equip- ment	Fig- ure	Item
	P	()		4910-262-0392	TRESTLE, MOTOR VEHICLE MAINTENANCE: 5 ton capacity, adjustable type 15 in. closed h, 25 in. extended h, 12 in. lg o/a 10 in. w o/a base; MILSPEC T-14521 size 5 ton.			1	*	38	7
	P	()		5120-240-5328	WRENCH, OPEN END, ADJUSTA- BLE: opening 0 to 0.947, 8 in. long.			1	*	38	21
	P	()		5120-240-1414	WRENCH, OPEN END, ADJUSTA- BLE: single-head type, 18 in. FED CG-631, type 1.			1	*	38	21
	P	()		5120-277-6470	WRENCH, OPEN END, ADJUSTA- BLE: single-head type, 36 in.			1	*	38	21
	P	()		5120-393-0560	WRENCH WHEEL BEARING.			1	*	38	8

Section III. MAINTENANCE AND OPERATING SUPPLIES

Component application	Source of supply	Federal stock No.	Description	Quantity required for initial operation	Quantity required for 8 hours operation	Notes
CRANKCASE	10	9150-265-9436(2)	OIL, LUBRICATING: 55-gal drum as follows: OE 30 OE 10 OES	24 qt	(3)	(1) Includes quantity of engine oil system
	10	9150-265-9429(2)		24 qt	(3)	Crankcase—18 qt
	10	9150-242-7604(2)		24 qt	(3)	Oil Filter—6 qts
CRANK, FUEL	10	9140-286-5283(2)	FUEL OIL, DIESEL: bulk as follows: DF-A DF-1 DF-2	100 gal (5)	76 gal (6)	(2) See SM 10 C9100
	10	9140-286-5286(2)		100 gal (5)	76 gal (6)	tional data and procedure.
	10	9140-286-5294(2)		100 gal (5)	76 gal (6)	(3) See LO 5-3820-
ENGINE STARTING AIDS	10	2990-355-6377	CAPSULE, METAL: pressure primed (1 MO-10)	1 (8)		grade applicator
	10		WATER:	70 qt	(7)	plenishment inter
	10		ANTIFREEZE: 55-gal drums as follows: Ethylene Glycol Compound Arctic			(4) Use oil as prescribed
RADIATOR	9	6850-293-1990	OIL, LUBRICATING: (4)	5 qt	(3)	(5) Tank capacity.
	9	6850-174-1806				(6) Average fuel consumption 9.5 gal per hour operation.
	9					(7) Refer to organization for quantities, temperatures, specifications and replenishment
GEAR ASSEMBLY CON- VEYOR GEAR DRIVER	10	9150-577-5848	OIL, LUBRICATING: (4)	4 qt	(3)	(8) Quantity indicated for minimum required for
	10	9150-577-5845		2 qt	(3)	Start when temperature below 40° F.
	10	9150-257-5442		2 qt	(3)	
GEAR ASSEMBLY, DRIVE BRUSHER FRAMES	10	9150-577-5848	OIL, LUBRICATING, GEAR: 55-gal drums as follows: GO 140 GO 90 GOS	92 qt	(3)	
	10	9150-577-5845		92 qt	(3)	
	10	9150-257-5442		92 qt	(3)	
GEAR POINTS	10	9150-190-0907	CREASE, AUTOMOTIVE AND ARTILLERY: 35-lb pail GAA	4-lb	1-lb	

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EARLE G. WHEEL
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USAAARMBD (2)
USAAARMBD (2)
USAIB (2)
USAADBD (2)
USAAESWBD (2)
USAAVNBD (2)
USCONARC (3)
OS Maj Comd (5) except
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USARJ (10)
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USASMCOM (1)
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Engr Dep (OS) (10)
Army Dep (2)
USA Trans Tml Comd (2)
Army Tml (1)
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USAERDL (3)
USA Mbl Spt Cen (36)
ENGR Cen (5)
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Engr Fld Maint Shops (2)
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USA Corps (1)
MAAG (1)
JBUSMC (1)
Units org under fol TOE:
5-48 (2)
5-114 (2)
5-115 (2)
5-117 (2)
5-237 (5)
5-262 (5)
5-267 (1)
5-278 (5)
5-279 (2)
5-500 (EA, EB, GB) (2)

NG: None.

USAR: Same as Active Army except allowance is one copy to each unit.
For explanation of abbreviations used, see AR 320-50.